AN INVESTIGATION

INTO THE

COST OF TRANSPORTATION

ON

AMERICAN RAILROADS,

WITH

DEDUCTIONS FOR ITS CHEAPENING.

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COST OF RAILROAD TRANSPORTATION.

There is perhaps no subject which engages at present the attention of the people so much as railroad transportation, and it may be said that there is none which is so little understood. I propose to investigate the elements and define the principles bearing on the cost of railroad transportation. It will be seen from what I may have to say that the subject is one of considerable intricacy and complication. For this reason we can readily explain the great want of correct information and the diversity of opinion prevailing among those who have not made it a study. So varied are the conditions controlling the cost of railroad operation on different roads, or even on the same road at different times, that it is impossible to arrive at any fixed price for any definite service performed.

There might be some variation in the cost of manufacturing certain articles, or in raising the products of the soil in different parts of the country, yet they are inconsiderable as compared with the wide difference that exists between the cost of transporting one ton for one mile on one road and the same service on another, even if such roads are under the same management, and the same scale of prices for material and labor prevail.

This great existing and unavoidable difference in the cost of railroad transportation causes much dissatisfaction among those who have to pay higher rates than others for the same service performed, and this again leads to the many attempts which have been and are continually being made to enforce uniformity in the charges for railroad transportation. How far it may be practicable to secure such results or just to enforce them will appear in the course of this investigation.

In order to illustrate and make clear the subject of railroad transportation, it is proposed to analyze carefully and thoroughly the results of the operation of one road, to institute comparison with others, and then to ascertain the existing differences and the reasons therefor.

I have selected for this purpose the Louisville & Nashville and Great Southern Railroad, proposing to make use of the statistical information which has been carefully collected and recorded in the annual reports of that road.

The Louisville & Nashville Railroad Company operates 738.25 miles of road, including the branches, viz.:

Louisville & Nashville Railroad, Main Stem, between Louisville and
  Nashville.. 185.00 miles.
Knoxville Branch, from Lebanon Junction to Livingston .... 110.32 ···
Richmond Branch, from Richmond Junction to Richmond, Ky......... 33.46 ···
Bardstown Branch... 17.30 ···
Glasgow Branch.. 10.20 ···
Memphis Line, from Memphis Junction to Memphis (since 1871 con-
  solidated Memphis Branch, Memphis, Clarksville & Louisville
  and Memphis & Ohio Railroads)... 259.67 ···
Nashville & Decatur Railroad, from Nashville to Decatur (leased)..... 122.30 ···

  Total .... 738.25 ···

These roads are of various characteristics. Their operating expenses having been kept separate, an opportunity is given to make comparison between roads operated under various conditions and circumstances, but under the same management.

In the annexed tables will be found the statistical information taken from the reports of the Louisville & Nashville Railroad Company, and which give the general results of the operation of the several roads referred to during the last seven years. The data from which these results are derived are also given, so that the careful investigator can draw his own deductions, if not agreeing with those that I have drawn.

The mode generally adopted to express or estimate the cost of railroad transportation is to state the proportion of the operating expenses to the earnings. This may be sufficient to the bond or stockholder to enable him to ascertain whether the net earnings are sufficient to meet interest and pay dividends, but

it does not give any data on which a judgment can be formed as to the economy in the cost of operating the road. This cost may exceed the gross earnings, and yet the road may have been worked in the most economical manner; and on the other hand, net earnings of more than fifty per cent. may be shown while the road was worked with no economy. To ascertain whether a road is as cheaply operated as is practicable we must analyze in detail every item of expenditure, and see whether it has been reduced to a minimum.

It will therefore be necessary to consider carefully the details of cost, and thus to resort to a great many figures, which may at first deter the general reader from pursuing the study of this subject; but to encourage him I will hold out the hope that order and clearness will arise from the apparent confusion.

The different causes which produce differences in the cost of railroad transportation on different roads, or on the same road at different times, may be divided under the following general heads:

 I. The character of the road;

 II. Cost of labor and material;

 III. The speed of trains;

 IV. The amount and nature of the business of the road;

 V. The cost of the road and equipment.

In order to ascertain how far these causes, singly and combined, influence the cost of railroad transportation on the same or on different roads, it is necessary to establish a unit of comparison. The first that naturally suggests itself is the cost of transporting one ton of gross weight one mile, and by the term gross weight is meant the weight of the article transported and of the vehicle on which it is transported.

We are, however, more directly interested in learning the cost of moving one ton of net weight per mile, as well as the cost of transporting one passenger per mile. But in speaking of the cost of transporting one ton of gross or net weight or one passenger one mile, we have to do with very small figures; and as we desire to dissect every item of expense making up the cost

of moving one ton per mile (some of which items do not amount to the $\frac{1}{500000}$ part of the total cost), it will be preferable to adopt a larger unit of comparison, and as such I have selected the cost of running one train one mile.

This unit of comparison will not only serve to compare the cost of transportation, which is in direct proportion to the cost per train mile (provided the comparison is instituted between two trains carrying the same number of tons of net weight), but it will also serve as a measure of comparison of other characteristics of a road. Thus the *number* of train miles run over a road, the amount of *freight carried by each train*, etc., form the chief characteristic features which influence the cost of transportation to a very great degree.

We will now proceed to consider more in detail the various causes enumerated above which produce the difference in cost of railroad transportation on different roads, or on the same road at different times.

I. The Character of the Road:

ITS LENGTH, CURVATURE, GRADES (HEIGHT AND DISTRIBUTION); THE MANNER OF CONSTRUCTION OF ROAD, PERMANENT OR TEMPORARY; THE NATURE OF THE COUNTRY AS INFLUENCING THE COST OF MAINTENANCE, ETC.

The grades and curvatures of a road determine the net load (the number of tons of freight or the number of passenger-cars) that an engine of a certain power can draw. On the comparatively level roads in the West an engine of 16×24 inch cylinder can readily draw forty-five loaded freight-cars, each containing ten tons net, or four hundred and fifty tons per train. On the Southern Division of the Main Stem of the Louisville & Nashville Railroad an engine of the same power draws only seventeen cars, while on the Northern Division of the South and North Alabama Railroad an engine of the same power could draw only thirteen cars.

Supposing, for sake of comparison, the cost of running a train per mile to be the same on these several roads, and assuming the cost of moving one ton per mile to be one cent on the level

road, the cost per ton per mile on the Louisville & Nashville Railroad would be $\frac{450}{170}$=2.53 cents, and on the South & North Alabama Railroad $\frac{450}{130}$=3.54 cents per ton per mile, the difference in cost being due to difference of grades and curvatures of these several roads.

To some extent the disadvantages of the heavier grades can be overcome by the use of more powerful locomotives, involving, it is true, increased expense, but not in proportion to the increased service performed.

Thus on the Louisville & Nashville Railroad a freight locomotive of the heaviest class draws twenty-four cars, and on the South & North Alabama Railroad nineteen cars. Supposing the cost per train mile to be the same, the comparison of the cost per ton carried one mile would give the following results: If on the level road the cost were one cent per ton per mile, on the Louisville & Nashville Railroad it would be $\frac{450}{240}$=1.88 cents, and on the South & North Alabama Railroad $\frac{450}{190}$=2.47 cents.

These few examples will be sufficient to illustrate the effect of the difference in curvatures and grades upon the cost of transportation on different roads.

The cost of maintaining the road-bed, ballast (if any), bridges, depot-buildings, water-stations, etc., depends in a measure on the permanency of the construction; but, as will be seen hereafter, expenditures on this account do not produce the same differences in the cost of transportation on different roads as grades and curvatures do. These items of cost are peculiar to each road, and no general rule can be established by which they could be ascertained beforehand, but must be taken from experience in each case.

II. Cost of Labor and Material.

An examination of the difference in cost of transportation, arising from variations in the cost of labor and material employed, shows that while there is not much difference in the wages paid to skilled labor, there is often a difference of fifty per cent. in the cost of common labor. On some roads only $1 per

day is paid; on others $1.50, and sometimes more. This influences considerably the relative cost of road repairs, on which a large amount of unskilled labor is employed. The greater difference occurs, however, in the cost of cross-ties and fuel, particularly in the latter. On the Pennsylvania Railroad the average cost per train mile in 1872 for fuel was 6.5 cents, while on the Lake Shore & Michigan Southern Railroad in the same year the cost was 14.8 cents, and on the Boston & Albany Railroad 20.8 cents.

On the latter road the average number of tons of net freight carried in one train is 81, showing that for every ton carried on that road the cost is greater than the cost on the Pennsylvania Railroad — $\frac{20.8-6.5}{81}=$ .176 cents — on account of the difference in cost of the fuel, while assuming in this comparison that the quantity of fuel consumed per mile be the same.

III. Speed of Trains.

From the following extracts from Tables I and III will appear the relative cost of moving one gross ton of weight one mile on freight and passenger trains :

	1867.	1868.	1869.	1870.	1871.	1872.	1873.
MAIN STEM.	CENTS.	CENTS.	CENTS.	CENTS.	CENTS.	CENTS.	CENTS.
Freight (line 88, Table I).....	0.837	0.822	0.707	0.673	0.667	0.552	0.615
Passenger (line 71, Table I)..	1.670	1.560	1.440	1.410	1.320	1.230	1.270
Per cent. of cost of Freight to Passenger................	50	53	49	47	50	45	48
MEMPHIS BRANCH.							
Freight (line 89, Table III)..	1.082	0.929	0.718	0.763	8.816	....	....
Passenger (line 69, Table III)	2.141	1.914	1.299	1.572	1.622	....	....
Per cent. of cost of Freight to Passenger...............	50	48	55	48	50	....	....

This statement shows that the cost of one gross ton per mile on passenger-trains is about twice as much as on freight-trains, while the speed of the passenger-trains is two to two-and-one-half times as great as the speed of freight-trains. This will serve as an illustration of the effect of speed upon the cost of transportation.

IV. THE AMOUNT AND THE NATURE OF BUSINESS TRANSACTED, AND THEIR INFLUENCE UPON THE COST OF TRANSPORTATION.

The operating expenses may be divided into three classes: First, certain expenditures must be incurred, whether one or one hundred trains pass over a road; the road-bed must be kept in order, bridges in repair, ditches clear, cross-ties and other wood-work replaced when decayed, etc. This class of expenditures, entirely independent of the number of trains passed over a road, I will hereafter term "constant expenditures." When distributed over a larger number of train miles the average cost per train mile, and consequently the average cost of transporting one ton or one passenger per mile, is thereby reduced.

Under a second class of expenditures may be comprised all that are in some measure reduced with the increase of the number of train miles, but not in the same proportion. To this class belong the general expenses, superintendence, the cost of adjustment of track, the cost of agencies, etc.

The third class of expenditures increases in direct proportion as the number of trains over a road are increased. To this class belong engineers' wages, engine repairs, fuel, etc. In considering the items of cost which make up the cost per train mile this subject will be more particularly referred to. For the present it suffices to refer merely to the general principles governing the difference in the cost of transportation on roads on which the amount of business differs.

As an illustration of the effect of increased business on the reduction of the cost of transportation we will refer to Table I. On the 10th line of this table it will be seen that in 1867 8.55 trains were daily run over the Main Stem of the Louisville & Nashville Railroad. From that time on there has been a gradual increase in the number of trains, and in 1873 17.49 were run daily over the road. During the same period the expenditures per freight-train mile were reduced (see line 53) from $1.97 in 1867 to $1.59 in 1873, and the cost of carrying one ton of freight

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one mile (see line 83) from 2.19 cents in 1867 to 1.44 cents in
1873. There were other causes, which will be referred to here-
after, that aided in the reduction of expenditures per ton per
mile ; but the chief cause was the increase of business.

But not only the amount, but also the nature of the business,
influences greatly the cost of transportation on different roads.

On some roads a large proportion of the freight is carried in
one direction and only a small proportion in the other ; on other
roads the amount of traffic may be more evenly balanced in
opposite directions. Suppose a road on which the freight traffic
is all in one direction, and another on which it is the same both
ways ; the average load of a train would be twice as much on
the latter road as it is on the former, and under the supposition
that the cost per train mile was the same, the cost per ton would
be only one half.

On a road which does only a local business the average load
carried in trains will be less than on a road where there is a
large amount of business carried over the whole length of the
road in both directions, and the cost of transportation of local
freight will be so much greater. Thus, referring to Table II,
line 77, it will be seen that the average number of tons carried
in one train on the Knoxville Branch, a mere local road, averages
from 52.55 to 68.66 net tons per train during seven years ; while
on the Main Stem, over which a large amount of through busi-
ness is transacted, it varies during the same period of time (see
Table I, line 76) from 89.85 to 110.75 tons per train. No greater
number of trains are run on the Knoxville Branch than is abso-
lutely necessary to transact the business, and it is on account
of the peculiar nature of the business that makes it impossible
to carry the same net load on each train as is carried on the
Main Stem.

V. The Cost of the Road and Equipment,

AND CONSEQUENTLY THE INTEREST ON THE INVESTMENT CHARGEABLE TO THE OPERATING EXPENSES.

This item of expense belongs to the class called "constant expenditures." It is a fixed amount per annum, distributable according to the amount of work done on the road ; the greater the number of train miles, the less the amount of interest chargeable to the cost of each train mile, and the less the cost per ton per mile.*

To illustrate the effect of the interest account on the cost of transportation reference is made to Table I, line 7, which shows that in 1867 the yearly interest on the cost of the Main Stem of the Louisville & Nashville Railroad was 50.05 per cent. of the other operating expenses ; and, although the cost of the road in 1873 had been increased more than two millions of dollars (on account of the increased facilities required by the increased business), the annual interest in 1873 was only 37.87 per cent. of the operating expenses. The interest chargeable to each ton of freight carried one mile in 1867 (see Table I, line 84) was 1.14 cents, and in 1873 it was 0.55 cents.

By reference to Table II, line 7, it appears that on the Knoxville Branch the interest during the seven years from 1867 to 1873 varies from 99.44 to 191.03 per cent. of the operating expenses, and the interest chargeable to moving one ton of freight per mile on that road varies from 2.38 to 5 cents. (See Table II, line 82.)

On the Richmond Branch the interest varies during the five years of its operation from 127.34 to 243.12 per cent. of the cost of operation, and the cost per ton carried one mile, including the interest, is from 7.62 to 11.56 cents. (See Table IV, lines 5 and 91.)

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* The interest has been computed at the rate of seven per cent. per annum. It should perhaps have been computed at ten per cent.; but for the purpose of illustration the rate of interest is immaterial, and corrections can be readily made by those who prefer to adopt a different rate.

On the Pennsylvania Railroad the cost of one ton per mile in 1872 was 0.83 of one cent, and including interest 1.05 cents.

To show at a glance the characteristics of roads, and the diversity in the cost of transportation arising therefrom, the following table has been prepared from the annual reports for 1872 of the railroad companies named below. The interest has been calculated at the rate of seven per cent. on the cost of each road as stated in the reports.

NAME OF ROADS.	1 Number of daily trains over road...	2 Cost per passenger train mile...	3 Cost per freight-train mile...	4 Average cost per train mile...	5 Average number of net tons carried on each train...	6 Cost per ton per mile...	7 Percentage of interest to operating expenses...	8 Total cost per ton per mile, including interest...
	Trains				Tons.	Cents.	PerCt.	Cents.
Pennsylvania	41.3	$1.06	$1.09	$1.08	131.10	0.83	27.4	1.05
New York Central*	44.4	1.21	1.46	1.37	129.04	1.13	26.9	1.43
Lake Shore & Michigan Southern...	25.2	1.21	1.21	1.21	127.88	0.92	51.5	1.37
Erie	35.4	1.03	1.10	1.08	105.57	1.04	53.0	1.59
L. & N.—Main Stem	15.9	1.28	1.42	1.37	104.33	1.36	41.4	1.93
" Knoxville Branch	4.0	1.28	1.51	1.41	66.80	2.26	132.6	5.26
" Richmond Branch	2.8			0.96	12.80	3.84	177.5	10.55

Column 1 shows the number of daily trains over the road, indicative of the amount of business transacted.† Columns 2, 3, and 4 show the cost per train mile. Column 5 shows the number of net tons of freight hauled in each train, depending on the nature of the business and character of the road. Column 7

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*It is somewhat surprising to find that the average number of tons carried on the freight-trains of the New York Central, a road with light grades, is not greater than it appears from the report of that company for 1872. This may be accounted for by the fact that freight-trains are run with greater speed and perhaps with lighter locomotives than are used on roads with heavier grades. The cost per ton per mile would be increased from these causes, as fully explained elsewhere.

† Unfortunately in this average are included the trains on the branch roads of the trunk lines, which roads are sometimes longer than the main line, and as there are comparatively few trains run over them, the average number of daily trains is very much reduced. No information is given in the reports, except for the Pennsylvania Railroad, enabling us to ascertain the number of daily trains over the main line, which on that road was 80 (or 40 in each direction) in 1872.

shows the percentage of the interest to the operating expenses, depending on the cost of the road. Column 6 gives the cost per ton per mile for operating expenses without interest, and column 8 with interest, as the final result of the various characteristics of each road.

This general view of the causes that bring about such a great diversity in the cost of railroad transportation, the service performed being the same—viz., the movement of one ton of freight over a distance of one mile—must necessarily lead to the conclusion that it is impossible to secure uniformity in rates for railway transportation, with due regard to the rights of the parties performing the service.

We will now proceed, after having referred to the general principle that influences the cost of railway transportation on different roads, to show the actual cost of transportation. I propose to treat the subject under the separate heads of transportation on "passenger" and "freight" trains.

Cost of Transportation on Passenger-trains.

In endeavoring to ascertain the cost of transportation on passenger-trains, we find that there are certain expenditures common to both passenger and freight traffic, which can not be separately and with accuracy charged to each class of train service.

Of this nature are the expenditures on account of maintenance of roadway and track, water-stations, buildings, general expenses, etc. In examining the reports of railroad companies in which the cost of passenger and freight traffic is stated separately, we find that a certain proportion of these common expenses is "allotted" arbitrarily to each kind of traffic. For example, on the Pennsylvania Railroad one third is charged to passenger traffic and two thirds to freight, on the Erie Railway two fifths to passenger and three fifths to freight.

In the reports of the Louisville & Nashville Railroad Company, and also in the annexed tables, the division has been based upon the relative passenger and freight-train mileage. A

division computed upon such a basis appears to me as nearly correct as it may be possible to attain. The road-bed, ditches, ballast, cross-ties, bridges, etc., must be kept in the same good order, and the same amount of money must be expended on this account whether they are used by passenger or freight-trains ; therefore each class of traffic should pay proportionately to the train mileage.

The question, however, arises as to the relative expenditure in the repair of rails for each class of trains. It may be said that a proper division of this expenditure should be based upon the relative weight of each class of trains. A division upon this basis would make the cost per mile of passenger-trains less than that of freight-trains.

In Table I, lines 47 and 48, and Tables II and III, lines 67 and 87, is given the relative weight of freight and passenger-trains (exclusive of locomotive) on the roads mentioned in these tables, from which it will be seen that, after adding the weight of locomotive (see Table VIII), the gross weight of a freight-train is from two to two-and-a-half times that of a passenger-train. The speed of a passenger-train, however, is usually from two to two-and-a-half times greater than the speed of freight-trains, and on that account it would not seem unreasonable to estimate the cost of repairs of iron and adjustment of track per mile run the same for freight and passenger-trains. It is true that on a perfectly smooth track the speed of a train would have little influence upon the wear of the iron. In practice, however, there are more or less imperfections in a track, especially at the joints, and the wear and tear of the track must necessarily be increased as the speed of the trains increases. I fear that it will be impossible to ascertain the exact amount of such increased wear, but am inclined to believe that the cost of repairs of track and its adjustment is very nearly the same for freight and passenger-trains when the relative weight of trains and rate of speed is about as above given.

To reduce this question to figures, we will state that the average cost of repairs of rails per train mile on the Main

Stem of the Louisville & Nashville Railroad during seven years was 8 cents ; on the Pennsylvania road in 1872, 8.6 cents ; on twenty-eight roads in Massachusetts, 9.2 cents ; on the Lake Shore & Michigan Southern, 9.6 cents ; and on the Mobile & Ohio, 9 cents. Assuming 9 cents as the average cost per train mile for the renewal of iron, and the average proportion of the weight of freight-trains to passenger-trains at 2¼ to 1, the cost per freight-train mile would be 9.76 cents, and per passenger-train 4.34 cents. The difference therefore in estimating the cost per train mile the same for either class of traffic, or by estimating it according to the weight of the trains, would be 5.4 cents.

In the absence of data from which to determine the relative cost of repairs of rails, and for the consideration just mentioned, we can not commit a very great error if we assume the cost of repairs of rails and adjustment of track to be the same for passenger and freight-trains.*

* When the weight of a freight - train is more than 2¼ of the weight of a passenger - train, the error, if any, would of course be greater; and in that case a division of expense for repair of iron and adjustment of track might be made on the basis of double the weight of the passenger-train to the weight of the freight-train. Adjustment of track is understood to include the labor of keeping the track in alignment and surface. The cost of this work on the Louisville & Nashville Railroad and Branches will be found in Table IX.

In the report of the Pennsylvania Railroad for 1872 the division of the expenses of the cost of maintenance of roadway and buildings on the basis adopted by that company makes the cost for freight-trains on account of maintenance of road and buildings 31.2 cents per mile, and of passenger-trains 39.1 cents (see Table XI); and under the rule adopted by the Erie Railway it makes the cost per mile run for freight-trains (see Report for 1873) 20.41 cents, and for passenger-trains 39.98 cents, the cost of a passenger-train mile being nearly twice as much as that of the freight-train mile. No good reason seems to exist for so great a difference. This arbitrary "allotment" may account for the fact that in the report of the Erie Railroad Company for 1872 the cost of passenger transportation very nearly equals the revenue, the former being stated at $3,402,750, and the latter at $3,514,318. According to the basis of division adopted by the Pennsylvania Railroad, the total cost per passenger-train mile is $1.12, and freight-train mile $1.07. If the division is adopted as herein proposed, the cost per passenger-train mile is $1.06, and per freight-train mile $1.09. (See Table XI.) On the Erie Railroad the cost per passenger-train mile in 1873, according to the mode of division adopted by that road, is $1.10, and the cost of a freight-train mile 90.6 cents. According to the proposed division it is respectively 94 and 96 cents. It will be readily seen how wide the discrepan-

Having determined upon the distribution of expenses common to passenger and freight business, we can next ascertain the cost per passenger-train mile.*

Table I, line 52, gives the cost on the Main Stem of the Louisville & Nashville Railroad. It varies in the seven years from $1.28 to $1.67.

On the Knoxville Branch, during the same time (Table II, line 48), the cost varies from $1.28 to $1.50; on the Memphis Branch (Table III, line 48), from $1.16 to $1.52; on the Memphis Line and Nashville & Decatur Railroad (Table VI, line 52), from $1.29 to $1.40.

On twenty-eight roads in Massachusetts, in 1872, the cost per train mile, freight and passenger, varies from 86 cents to $1.79. The average is $1.31.†

On the Pennsylvania Railroad the cost per passenger-train mile (corrected division), in 1872, is $1.06; on the Erie Railroad (corrected division), in 1873, it is 94 cents.

The cost per passenger-train mile on the roads named varies, according to the above, from 86 cents to $1.79.

The cost of moving one passenger-train for a distance of one mile having been determined, we can proceed to ascertain the average cost of moving one passenger-car per mile.

cies arising from a want of a uniform basis in dividing the expenditures between the passenger and the freight business must be, and hence it was necessary to refer to the subject here, in order that the comparison of the cost of railroad transportation on different roads, as shown in the reports, may be made with proper discrimination. It is very desirable that railroad companies should endeavor to ascertain and generally adopt a correct basis of division of all such expenditures, which can not be directly accounted for as being chargeable either to the passenger or freight traffic.

* The reports of railroad companies do not generally contain a statement of the correct train mileage, under which term is understood the actual number of miles run by trains earning revenue. Instead of this information, frequently the engine mileage is merely shown, which includes the switching mileage, or the mileage made by engines running light over the road, or by the assistant engines used on grades. The engine mileage is often from ten to sixteen per cent. greater than the train mileage. Hence in comparing the cost of train mileage on different roads we must know whether we have to do with the train mileage or engine mileage.

† On the Hanover Branch, which is only eight miles long, the cost per train mile is $2.42. As this is an exceptional case, I have not included it in the comparison.

Dividing the total mileage made by cars running on passenger-trains by the number of passenger-train miles, gives us the average number of cars on each train ; and dividing this again into the average cost of a train mile, we have the cost per car. Or we can at once divide the total number of miles run by cars on the passenger-trains into the total amount expended on account of the passenger traffic. In this manner we find the cost per car mile on passenger-trains, exclusive of interest on investment, on the various roads operated by the Louisville & Nashville Railroad, as follows :

Table I, line 25—Main Stem, during seven years ....from 26.28 to 30.00 cents.
Table II, line 25—Knoxville Branch, during seven years..from 29.15 to 40.88 cents.
Table III, line 25—Memphis Branch, for five years.........from 27.55 to 40.56 cents.
Table VI, line 25—Memphis Line, for two years............from 31.80 to 32.17 cents.
Table VI, line 25—Nashville & Decatur R. R., for one year................ 36.76 cents.

Including the interest on the investment, we have the cost of transporting one passenger-car one mile on the same roads :

Table I, line 26—During seven years.........................from 37.17 to 45.02 cents.
Table II, line 26—During seven years........................from 79.08 to 102.73 cents.
Table III, line 26—During five years.........................from 45.08 to 65.91 cents.
Table VI, line 26—During two years...........................from 42.70 to 43.70 cents.
Table VI, line 26—During one year.. 54.34 cents.

From this statement will again appear the great diversity (even on roads under the same management) in the cost of transportation, especially when interest on the investment is added. Without the interest the proportion of the lowest to the highest cost per car mile is as 1 to 1½, and with the interest it is as 1 to 2¾.

In endeavoring to compare the cost of a passenger-car mile on the road above named with other roads, we find that the reports of only a few railroads contain the necessary information—viz., the number of miles run by cars in passenger-trains ; or where this information is sometimes given, the cost of passenger traffic is generally not given separately from the freight traffic. Hence only a few comparisons can be made. On the Pennsylvania Railroad the number of miles run by passenger-

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cars between Philadelphia and Pittsburgh (Main Line and Branches) was in 1872, 15,023,168, and the cost of the passenger traffic for the whole year was $3,218,181.45, the cost per car mile 21.42 cents.

On the Mobile & Ohio Railroad the number of miles run by passenger-cars is given, but the expenses on account of passenger traffic are not stated separately from the freight; but proportioning the total expenses according to the miles run (the average cost per train mile being $1.46), the cost of one car would be 32 cents per mile run. On the Nashville & Chattanooga Railroad (report of 1872) the cost is stated to be 26 cents; on the Louisville, Cincinnati & Lexington Railroad in 1872 it was 29.6 cents.

It appears then that the cost per passenger-car on the roads just mentioned is from 21.42 to 30 cents per car.

The next inquiry, after having ascertained the cost of one car per mile run, is as to the cost of the load carried in the cars. Passenger-trains carry loads of very different character:

1. Passengers, carried in the regular passenger and in sleeping or parlor-cars;
2. Baggage, carried in the baggage-cars;
3. Express matter, carried sometimes in the baggage-cars, sometimes in special cars;
4. Mail, sometimes carried in a special (the postal) car; sometimes in special apartments of various dimensions in the baggage-car; and sometimes in the baggage-car, like baggage, in charge of the baggage-master.

The cost of performing each kind of service depends much upon the various modes named by which it is performed. Hence the difficulty of arriving at correct results; and this difficulty is much increased by the fact that the reports of railroad companies do not give the necessary data from which to deduce the cost of each service separately. The most that we can learn from these

reports (and this only in a few instances) is the cost of carrying one car for one mile in passenger-trains. This being known, and the number of miles run by passenger, baggage, express, and mail-cars being also given, each separately, we can multiply the number of miles run by cars in which passengers were carried by the cost per car, and divide this amount by the number of miles traveled by passengers ; the result will show the cost of carrying one passenger one mile, not including his baggage, which is carried in the baggage-car. To ascertain the cost of the latter we must know what portions of the baggage-car are occupied respectively by the baggage, mail, and express. When all three classes of freight are carried in the same car, the cost of each will be in proportion to the space occupied, and must be ascertained accordingly. When special cars are used for the mail and express, the cost per car will apply at once to the same. In this manner we may estimate the cost of each kind of service performed on passenger-trains, but the results will only be approximately correct. The cars which are used on passenger-trains for various services differ very much in weight. Thus the sleeping - cars generally weigh 64,000 pounds, and an express-car 24,000 pounds. If the charges for services performed on passenger-trains shall be regulated and assessed on all parties using the train in accordance with the cost of that service, it is necessary to know the dead weight which has to be carried for each kind of load, including the weight of the load itself.

Tables I to VI give this information in regard to the various roads operated by the Louisville & Nashville Railroad Company. Table VIII gives the weight of each class of cars and locomotives ; also the average weights. The weight of the mail has been taken from the returns made to the Post-office Department, on which compensation to the railroad company is based. The weight of the express matter has been ascertained during a month which represents, according to revenue (compensation being based on weight), the average weight carried on the road during the several years shown in the tables. The only portion

of the weight which could not be directly ascertained is the weight of the passengers and baggage. I have estimated the weight of a passenger at 150 pounds, including the light baggage which is usually carried in the passenger-cars ; also the proportion of weight of the train-employees, officers of the road, and dead-heads. The weight of the baggage carried in the baggage-cars I have estimated at 50 pounds per passenger.

The following condensed statement shows the cost of carrying one ton of gross weight on passenger-trains over the various roads mentioned :

	1867.	1868.	1869.	1870.	1871.	1872.	1873.
	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.
MAIN STEM—							
Exclusive of interest, Table I, line 71..	1.67	1.56	1.44	1.41	1.32	1.23	1.27
Inclusive of interest, Table I, line 73..	2.51	2.37	2.19	1.99	1.80	1.74	1.75
MEMPHIS BRANCH & MEMPHIS LINE—							
Exclusive of interest, Tables III and VI, lines 69 and 71....................	2.14	1.91	1.30	1.57	1.62	1.42	1.34
Inclusive of interest, Tables III and VI, lines 71 and 73.	3.48	3.04	2.12	2.21	2.20	1.88	1.86
NASHVILLE & DECATUR RAILROAD—							
Without interest, Table VI, line 71.....	....	....	....	......	....	....	1.70
With interest, Table VI, line 73.........	....	....	....	......	....	....	2.51
KNOXVILLE BRANCH RAILROAD—							
Without interest, Table II, line 69......	2.10	2.02	1.90	1.58	2.08	1.75	2.00
With interest, Table II, line 71.........	5.18	5.88	5.56	4.27	4.75	4.07	3.99

In addition to the above, reference is made to Table IV, lines 81 and 83, and Table V, lines 83 and 85, showing cost per ton of gross weight on Bardstown and Richmond Branches; but as passengers and freight are carried on the same train, at a speed of about twelve miles per hour, no comparison can be made with the cost of transportation on a purely passenger-train.

By reference to Tables I, II, III, and VI, we find the cost per net ton per mile carried on passenger - trains, including passenger, baggage, express, and mail, to have been as follows :

	1867.	1868.	1869.	1870.	1871.	1872.	1873.
MAIN STEM—	Cents.	Cents	Cents.	Cents.	Cents.	Cents.	Cents.
Without interest, Table I, line 74.......	21.93	20.73	19.29	20.59	20.40	20.24	21.35
With interest, Table I, line 75...........	32.90	31.54	29.35	29.03	28.27	28.62	29.43
MEMPHIS BRANCH & MEMPHIS LINE—							
Without interest, Table III, line 72, } Table VI, line 74..................... }	20.17	18.62	14.85	19.81	19.18	26.69	26.25
Including interest, Tables III and } VI, lines 73 and 75.................. }	32.78	29.61	24.30	27.92	26.01	35.43	36.56
NASHVILLE & DECATUR RAILROAD—							
Without interest, Table VI, line 74.....	....	....	....	....	....	....	35.53
Including interest, Table VI, line 75...	....	....	....	....	....	....	52.51
KNOXVILLE BRANCH RAILROAD—							
Without interest, Table II, line 72......	22.88	22.84	22.01	20.07	25.18	23.09	26.08
Including interest, Table II, line 73....	56.43	66.46	64.36	54.45	57.55	53.71	52.01

The above shows that on the roads named the cost of carrying a net load on the passenger-trains (no distinction being made between passenger, baggage, mail, and express) is from 14.85 to 35.53 cents per ton per mile; and if including interest, from 24.30 to 66.46 cents per ton per mile. The general average without interest is about 20 cents per ton per mile. The weight of a passenger with baggage having been estimated at 200 pounds, it follows that the average cost of carrying a passenger is about 2 cents per mile.

In the following the cost of carrying each class of load on the passenger - trains of the Main Stem of the Louisville & Nashville Railroad will be computed separately, and for that purpose the cost during the year 1872–73 (shown in Table I) will only be considered.*

The passengers are carried in sleeping and regular passenger-cars.†

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* The reader who does not wish to follow the computations in detail is referred at once to the results on page 24.

† The number of sleeping-car passengers between Louisville and Nashville was 8,555; between Louisville and Memphis Junction, 17,171 ; total, 25,726. Number of miles traveled by sleeping-car passengers, 3,608,853; number of *tons* of passengers carried one mile, 270,664 ; deduct this from the total (line 64), leaves tons of passengers carried one mile in regular passenger-cars 1,185,491, and miles traveled by passengers in the regular cars (line 54) 15,859,877. Average number of passengers in one sleeping-car 9.62, and in one passenger-car 17. These data, not shown in Table I, are to be used in the calculation.

Cost of Carrying Passengers in Regular Passenger-cars.

Line 58—Tons of dead weight one mile in passenger-cars..17,674.332
Tons of net* weight one mile in passenger-cars............... 1,185,491

Tons of gross weight (at 1.27 cents per ton)....................18,859,823=$239,519 75
Passengers carried one mile*..15,859,877
Cost per passenger per mile without baggage................... 1.51 cents.

Passengers in Sleeping-cars, without Baggage.

Line 59—Tons of dead weight one mile in sleeping-cars...12,010,944
Tons of net* weight one mile in sleeping-cars   270,664

Tons of gross weight (at 1.27 cents per ton) ....12,281,608=$155,946 72
Passengers carried one mile*....................................... 3,608,853
Cost per sleeping-car passenger per mile without baggage... 4.32 cents.

Passengers in Passenger and Sleeping-cars.

Lines 58 and 59—Tons of dead weight in cars...............29,685,276
Line 64—Tons of net weight in cars 1,460,155

Tons of gross weight in cars (at 1.27 cents per ton).........31,145,431=$395,546 97
Line 54—Passengers carried one mile.........................19,468,730
Average cost per passenger without baggage .... 2.03 cents.

Mail.†

Line 62—Tons of dead weight of postal cars 2,565,788

Of which is used by mail $\frac{32.25}{50} =$ 1,654,933
Line 67—One half mail carried in postal car, tons............   65,398

Tons of gross weight‡ (at 1.27 cents) .... 1,720,331= $21,848 20
Cost per ton per mile of mail matter carried in postal car.... 33.40 cts.

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* See note (†) on page 21.

† One half of the mail is carried on two trains in cars fifty feet in length (six-wheel trucks), weighing twenty-three tons, but only 32.25 feet of it are used for mail purposes; 17.75 feet are used for express. The other half of the mail is carried in the baggage-cars, the same as baggage or express matter. By actual measurement it is found that half a ton of mail matter occupies a space of 4×3×7 feet. Allowing two and a half feet additional room for the operation of the baggage-master, in all nine and a half feet (the width of the car), and piling up the mail three feet high, half a ton of mail matter would occupy four feet of the length of the baggage-car. By piling it up six feet high, one ton could then be stored in a space occupying four feet of the length of the baggage-car. Room has to be provided for the largest amount of mail matter that may accumulate at any one time in the car. It is not practicable to reduce the size and weight of the car during the trip to suit the constantly-changing weight of the mail. Hence in the above computation the weight of four feet of the baggage-car, which will accommodate mail matter up to one ton (about one half of the mail matter carried on this route), is charged to the mail service in baggage-cars. In practice fourteen feet are used for that purpose. The same car which carries baggage and mail to Nashville has to continue its trip to Montgomery over two other mail routes on which an apartment of that size for the route agent and distribution of mail is required. But in the above computation the smallest possible space has only been charged to the mail service.

‡ Postal cars made only 301½ round trips during last year, on account of cholera in Nashville. For 313 trips the cost would have been $22,587.18.

The other half of the mail is carried in baggage-cars, for which one twelfth of the room of the baggage-car is used :

Line 60—One twelfth of dead weight of baggage-cars, tons   504,342
Line 67—One half mail, tons.....................................   65,398

Tons of gross weight (at 1.27 cents).............................   569,740= $7,256 70
Cost per ton per mile of mail matter carried in baggage-cars..   11.1 cts.
Total cost of carrying mail per year in postal and baggage-
    cars (exclusive of delivery) $29,104 90

Express.

The express is carried on all trains.   The accommodations provided for it are : 1. Special express-cars ; 2. One third of all the baggage-cars ; 3. $\frac{17.75}{50}$ feet of the postal car.

Line 61—Tons of dead weight of express-cars   1,363,128
Line 60—Tons of dead weight of baggage-cars ($\frac{4}{12}$)........   2,017,368
Line 62—Tons of dead weight of postal cars ($\frac{17.75}{50}$).....   910,855

Total dead weight, tons..   4,291,351
Line 66—Net weight of express matter, tons...................   422,326

Total tons of gross weight (at 1.27 cents) ....   4,713,677= $59,863 70
Cost per ton per mile of express matter.........................   14.17 cts.

Baggage.

Line 60—Tons of dead weight, baggage ($\frac{7}{12}$)   3,530,394
Line 65—Weight of baggage, tons   486,718

Total tons of gross weight (at 1.27 cents)......................   4,017,112= $51,017 32
Cost per ton per mile of baggage................................   10.48 cts.
Cost per passenger per mile for baggage........................   0.27 cts.

Baggage, Mail, and Express (exclusive of Mail in Postal Cars).

Total tons of gross weight, express   4,713,677
Total tons of gross weight, baggage   4,017,112
Total tons of gross weight, mail, exclusive of postal car.....   569,740

Total tons of gross weight, express, mail, and baggage, at
    1.27 cents)...   9,300,529=$118,116 72

Line 66—Total tons of net weight, express   422,326
Line 65—Total tons of net weight, baggage   486,718
Line 67—Total tons of net weight, one half mail.....................................   65,398

Tons net weight, baggage, mail, and express   974,442
Cost per ton per mile of net weight, baggage, mail, and express.............. 12.12 cts.

The following is a synopsis of the results obtained :

1. Cost per ton per mile of gross weight, 1.27 cents.

2. Cost per ton per mile of net weight, 21.35 cents (passenger, baggage, mail, and express, regardless of classification ;

see Table I, line 74, year 1873). For every ton of paying weight 15.8 tons of dead weight (exclusive of locomotives) have been carried.

3. Passenger carried one mile on regular passenger-cars (inclusive of baggage), 1.78 cents. For every passenger 1.3 tons of dead weight have been carried.

4. Passenger carried one mile on sleeping-cars (inclusive of baggage), 4.59 cents. For every passenger 3.5 tons of dead weight have been carried.

5. Passenger carried one mile on regular and sleeping-cars (inclusive of baggage), 2.3 cents. For every passenger 1.7 tons of dead weight have been carried.

6. Baggage for each passenger (50 lbs.) carried one mile, 0.27 cents. For every 50 lbs. of baggage 350 lbs. of dead weight have been carried.

7. Express matter, one ton, per mile, 14.17 cents. Ten tons of dead weight are carried for each ton of net weight.*

8. Mail matter, one ton, per mile, in the baggage-cars, 11.10 cents. Dead weight carried for each ton of mail, 7¾ tons.

9. Mail matter carried in postal cars, one ton, per mile, 33.4 cents. Dead weight carried for each ton of mail in postal car, 25.29 tons.

10. Postal car 32.25 feet in length, per mile run, 19.59 cents.

11. Postal car, per mile of road per year of 313 days, $122.63, and per year of 365 days, $143.

- 12. Whole mail service on 185 miles of road, per annum, exclusive of delivery of mail (the postal car making 313 round trips), $29,843.88.

13. Cost of mail service per mile of road, per year, $161.00.

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* This large amount of dead weight carried is partly due to the fact that the bulk of the express matter goes South and only a small proportion North; also to the fact that the largest amount of express matter is distributed along the line of road, only a small proportion going through. Accommodation has to be provided for the largest amount that usually starts out from Louisville, and when this is delivered (perhaps at the next few stations) the cars have to complete their trip, and return from the South comparatively empty.

The following is a computation of the cost of transportation on passenger-trains in 1872–73 on Knoxville Branch. (See Table II.)

Line 69—Cost per ton per mile gross weight .... 2.00 cts.
Line 72—Cost per ton per mile net weight, including passenger, baggage, mail, and express.......................... 26.08 cts.
(For every ton of paying weight 12 tons of dead weight were carried.)
Line 53—Cost per passenger without baggage.................. 2.70 cts.
Lines 51 and 52—Number of passengers carried in one train 39.61, and in one car 14.42.

The baggage, mail, and express are carried in the same car. The car is 50 feet long; 14.7 feet are occupied by mail, and 17.4 feet each by express and baggage.

Baggage.

Line 56—Tons baggage-car $\left(\frac{17.4}{50}\right) \times$ 1,357,200 = 472,305
Line 61—Tons of baggage.......................... 67,467

Total (2 cents per ton) ....539,772 = \$10,795.44
Cost per ton of baggage .... $\frac{\$10,795.44}{67,467}$ = 16.0 cts.
Cost for baggage per passenger..... $\frac{\$10,795.44}{2,698,268}$ = 0.4 cts.
For every 50 lbs. of baggage 400 lbs. of dead weight are carried.
Cost per passenger per mile with baggage.........3.10 cts.

Express.

Line 56 — Tons of dead weight (baggage-car
$\frac{17.4}{50}$) $\times$ 1,357,200.............................. 472,305
Line 62—Tons of net weight........................ 126,432

Tons of gross weight, at 2 cents per ton............ 598,737 = \$11,974.74
Cost per ton of express matter........ $\frac{\$11,974.74}{126,432}$ = 9.47 cts.
For every ton of express matter 3.7 tons of dead weight are carried.

Mail.

Line 56—Tons baggage-car $\left(\frac{14.7}{50}\right) \times$ 1,357,200 = 370,197
Line 62—Tons of mail.............................. 4,288

Total tons of gross weight, at 2 cents per ton..... 374,485 = \$7,489.70
Cost per ton of mail matter.......... $\frac{\$7,489.70}{4,288}$ = 174.66 cts.
For every ton of mail matter 86.3 tons of dead weight are carried.
Cost per mile run of 14.7 feet of car $\frac{\$7,489.70}{67,860}$ = 11.03 cts.
Cost per year for 313 round trips, per mile........ \$69.05

In these computations of the cost of the different services performed on the passenger-trains we have assumed that each service is chargeable with the proportional cost of the dead weight ; but conditions may arise requiring a modification of this basis of computation — and this is the case, for example, on roads on which sleeping-cars are being run. The transportation of passengers in sleeping and parlor-cars forms a comparatively new and a peculiar feature on American railroads. No additional compensation is received, as a rule, by railroad companies for this service, although it involves great additional expenditures. In many cases the charter limitation prevents an increase in the passenger fare ; in other cases, although permitted by law, no additional charge is made ; so that the amount expended by railroad companies on this account is either a free or a compulsory contribution, as the case may be, to the convenience and comfort of the traveling public, benefiting the railroad companies in so far only as the amount of travel may be thereby increased.*

To secure this result was no doubt the chief inducement to the introduction of sleeping-cars ; they made their way into use readily, under the belief that one ordinary passenger-car could be dispensed with, the "sleeper" taking its place, and that the only additional expense incurred would be in hauling a heavier car. The first "sleepers" were, as compared with those now in use, of light weight. They were generally put on the road at the expense of some outside party, so that the railroad companies felt recompensed by obtaining an additional car.

It was soon found, however, that these cars could not take the place in the train of an ordinary car, and the load of the

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* It must be stated that the additional charge made to the passengers for sleeping or parlor-car accommodation is intended to cover the attendance, the use of beds, and the interest on the investment, as well as the patent-fee on the interior arrangement of the sleeping-car. The railroad companies keep the cars in repair (except bedding), and haul them over the road without making any additional charge to the passenger. In some instances, however, the railroad company is also the owner of the sleeping-cars, or a part owner, and collects the whole or a portion of the sleeping-car fare; but this is an exception to the general practice.

trains had therefore to be increased by the whole weight of a sleeper. This weight was gradually augmented, until it has now become as heavy as that of two ordinary passenger-cars of the lighter class.

So general has now become the use of sleeping-cars, and so indispensable are they to the traveling public, that on some roads trains are run consisting almost entirely of such cars.

From a small beginning this peculiar service has grown to so large proportions as to involve annually a very heavy expenditure on the part of railroad companies without recompense. It is therefore of considerable interest to know the exact amount of money so expended, and to ascertain how the cost of other services rendered on passenger-trains are affected thereby. This we propose now to do.

Passenger-trains, unlike freight-trains (and we refer here to "through" freight-trains), are on many roads not loaded to the full power of the locomotive. The cost of hauling one or more additional cars on a train, until the power of the locomotive is fully utilized, will be less than the average cost per car prior to such increase, and the average cost of the gross ton hauled will also be lessened. If therefore the estimate of the cost of the sleeping-car service is based upon the average cost per gross ton, as in the preceding computations (both for simplicity and to illustrate the effects of an increased load), it will show a reduction in the cost of the other services rendered as compared with the cost prior to the use of the sleeping-car. The sleeping-car service would therefore be overcharged to the extent of this reduction; and the other parties using the passenger-trains, if charged in accordance with cost, would become the beneficiaries to the same extent. Hence it appears that the sleeping-car service should only be charged with the *additional cost* incurred on its account, and that the cost of the other services rendered should be estimated as before the introduction of these cars.

The following is an estimate of the cost of hauling a sleeping-car of sixty-four thousand pounds weight one mile on the trains of the Louisville & Nashville Railroad, Main Stem, during

1872–73, assuming that the power of the locomotive had not to be increased on account of this service :

1. Repairs of sleeping-car per mile run (VII, 35)............ 1.9334 cts.

   (The cost of sleeping-car repairs is generally estimated at 4 cents per mile, including reconstruction when worn out. The cars on the Louisville & Nashville Railroad being new, the present cost is less.)

2. Oiling and inspecting car per train mile (VII, 40), 0.7132 cts. ; number of cars in train (I, 2), 4.88 ; per car $\frac{0.7132 \text{ cts.}}{4.88}$...................... 0.1461 cts.

3. Oil and waste per train mile (VII, 45), 0.9616 cts. ; cars in train, 4.88 ; per car $\frac{0.9616 \text{ cts.}}{4.88}$............ 0.1970 cts.

4. Train expenses, fuel, and lights (VII, 56), $\frac{7.4704 \text{ cts.}}{4.88}$.... 1.5308 cts.

5. Station expenses, cleaning cars (VII, 52), $\frac{2.5575 \text{ cts.}}{4.88}$..... 0.5241 cts.

   (On trains equipped with air-brakes no additional brakeman is required.)

   Total expenses per car... .... 4.3314 cts.

6. Fuel per mile run (VII, 43), 14.6891 cts., in proportion of weight of sleeper to total weight of train, $\frac{32.67 \text{ tons}}{164.43} \times 14.6891$ cts............ .... 2.9185 cts.

   (Weight of train, excluding locomotive (I, 47), 112.43 tons; locomotive and tender (VIII), 52 tons. Weight of sleeper (VIII), 32 tons; load (page 21, note †), 0.67 tons.)

7.* Repairs of iron (IX, 54) : cost per 100 tons of weight passed over it, 4.092 cts. (estimating the weight of passenger-trains at twice their actual weight); cost per sleeping-car $\frac{2 \times 32.67 \text{ tons}}{100 \text{ tons}} \times 4.092$ cts................... 2.6737 cts.

8.* Adjustment of track : per 100 tons of weight passed over track (IX, 53), 1.922 cts. ; assuming that the cost of adjustment of track is not in direct proportion to weight, but only one half, the cost per car is 1.922 cts. $\times \frac{32.67}{100}$ tons.......................... .... 0.6279 cts.

   Total additional cost of sleeping-car per mile run..... 10.5515 cts.

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*If the cost of repairs of iron was based only upon the actual weight passed over the track, the cost per mile of sleeping-car would be (IX, 49) $\frac{32.67}{100} \times 5.178$ cts.. 1.6916 cts.

And the cost of adjustment of track, on the same basis as above, would be (IX, 48) $\frac{32.67}{2 \times 100} \times 2.43$ cts... 0.3969 cts.

2.0885 cts.

Cost as per calculations 7 and 8.. .... 3.3016 cts.

Difference between one and the other mode of estimating................. 1.2131 cts.

The total number of sleeping-car miles in 1873 was (I, 17) 375,342 ; accordingly the

Total additional cost for this service, at 10.5515 çts.,
  was...   39,604   21
But the estimated cost on basis of computation made on
  page 22 was   155,946   72
Showing that this service has been overcharged with.......$116,342   51

and that the cost of the other services has been underestimated this amount.   The following corrections should therefore be made :

Total cost of passenger traffic (I, 49)................................   533,696   69
Deduct actual cost of sleeping-car service   39,604   21

Total cost of passenger service, except sleeping-car........$494,092   48

Total tons of gross weight carried in passenger service
  (I, 69)..   42,166,291
Deducting gross weight carried in sleeping-car service.....   12,281,608

Leaves...   29,884,683
Cost per ton of gross weight per mile, 1.653 cts., instead of 1.27 cts.

Revising the estimate made on pages 22 and 23 upon this basis, we have the following result :

Cost of carrying passengers in regular passenger-cars,
  18,859,823 gross tons at 1.653 cts.   311,736   34
Additional cost of sleeping-cars   39,604   21

    Total cost of carrying passengers, without baggage...$351,340   55

Average cost per passenger in regular and
  sleeping-cars (19,468,730).....................   1.804 cts.

Mail in postal car per y'r, 1,720,331 gross tons at 1.653 cts. $28,437   07
    Cost per ton per mile (65,398 net tons)... 43.483 cts.

Mail in baggage-car, 569,740 gross tons at 1.653 cts........   9,417   80
    Cost per ton per mile (65,398 net tons)...   14.4 cts.

Express, 4,713,677 gross tons at 1.653 cts.....................   77,917   08
    Cost per ton per mile (422,326 net tons).. 18.449 cts.

Baggage, 4,017,112 gross tons at 1.653 cts. $66,402 86
    Cost per ton per mile (486,718 net tons).. 13.642 cts.
    Cost of bag'ge for one passg'r (19,468,730)   0.341 cts.
    Cost per passenger, including baggage ...   2.145 cts.

Baggage, mail in baggage-car, and express, 9,300,529 tons
    at 1.653 cts..... .... 153,737 74
    Cost per ton per mile, baggage, mail, and
    express..... .... 15.777 cts.

These results should be compared with those on pages 23
and 24, which give the estimated cost of the same service, based
upon the average cost per gross ton.   The comparison will
show the effect of increased load on cost of transportation on
passenger-trains, upon the supposition that the locomotive has
sufficient power to draw the additional load.   Should, however,
the use of heavier locomotives become necessary, additional
expense will have to be incurred, which may be estimated as
follows.   The weight of the locomotive and tender is supposed
to have increased from 45 tons to 52 tons, corresponding with
the actual increase which has taken place on the Louisville &
Nashville Railroad since 1869 :

For repairs of iron (IX, 54), $\frac{7 \times 2}{100} \times 4.092$ cts. .... 0.5728 cts.
For adjustment of track (IX, 53), $\frac{7}{100} \times 1.922$ cts. .... 0.1345 cts.
For additional fuel, $\frac{7}{164.43} \times 14.6891$ cts. .... 0.6253 cts.

    Total .... 1.3326 cts.
Add to this the cost per car per mile as before estimated.. 10.5515 cts.

    Total per additional car per mile*...................... 11.8841 cts.

Should the load of a passenger-train be increased beyond the
power of the heaviest engine that can be safely used on the
track, it then becomes necessary to use an additional engine,
and the cost of running it would be the cost of hauling the
additional load.   This cost may be estimated approximately as
follows, on the supposition that the weight of the locomotive
and tender is $37\frac{1}{2}$ tons :

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  * In this estimate no allowance is made for the increased wear of iron due to the
concentration of greater weight on the driving-wheels (from $16\frac{1}{2}$ to 20 tons) ; the
increased wear is supposed to be in direct proportion to the increased weight.   No
allowance is made for increased cost of repairs of engine, which may approximately
be taken in proportion to the increased value of the heavier over the lighter engine;
and no interest is estimated on the increased cost of the heavier locomotive.

Locomotive repairs per mile, estimated at..... .... 7.0000 cts.
Engineer and fireman's wages (VII, 37)..................... 9.4609 cts.
Watching and cleaning locomotive (VII, 38)................ 1.8437 cts.
Oil and waste used on locomotive (VII, 44)................... 1.0362 cts.
Fuel (VII, 43) ; weight of engine, $37\frac{1}{2}$ tons ; weight of
    car, 32.67 tons ; total additional weight, 70.17 tons ;
    cost per mile, $\frac{70.17}{164.43} \times 14.6891$............................. 6.2678 cts.
Repairs of iron (IX, 54), $\frac{2 \times 70.17}{100} \times 4.092$.................... 5.7427 cts.
Adjustment of track (IX, 53), $\frac{70.17}{100} \times 1.922$................. 1.3488 cts.
Car expenses (see page 28) .... 4.3314 cts.

    Total .... 37.0314 cts.

But whenever the necessity for the use of two engines arises, it becomes preferable to run an additional train.

The additional cost per mile of running one train on the Main Stem of the Louisville & Nashville Railroad would be as follows, supposing the train to consist of

An engine, weighing, inclusive of tender .... 45.0 tons.
Three passenger-cars, each $18\frac{1}{2}$ tons.... .... 55.5 tons.
One baggage, express, and mail-car............................ 20.0 tons.

    Total weight of train..................................... 120.5 tons.

(Reference is made to Table IX. All such items of expenditure (constant expenditures) which are incurred independently of the additional train are omitted.)

Repairs of iron (IX, 54), $\frac{2 \times 120.5}{100} \times 4.092$ cts................. 9.8617 cts.
Adjustment of track (IX, 54), $\frac{120.5}{100} \times 1.922$ cts............. 2.3160 cts.
Locomotive repairs (IX, 33) .... 9.8886 cts.
Engineer and fireman's wages (IX, 37)........... .... 9.4609 cts.
Watching and cleaning engines (IX, 38) .... 1.8437 cts.
Conductor and brakeman (IX, 51) .... 8.6365 cts.
Damage to stock (IX, 65) .... 2.9555 cts.
Items 34, 35, 40, 42, 45, 56, 62, 63, 65—Total per train
    mile of 4.88 cars, 26.5926 cts., and per train of 4
    cars, $\frac{4}{4.88} \times 26.5926$ .... 21.7972 cts.

    Total additional cost per train mile..................... 66.7601 cts.

But in case an additional train is run, more facilities for travel are furnished, from which may reasonably be expected an increased business ; and hence the additional cost of a train

may under certain circumstances not be chargeable altogether to hauling one additional car.

To form a general opinion as to the influence which the increase of weight on passenger-trains, and the consequent increase in their number, has upon the cost of operating a road, the experience of the Louisville & Nashville Railroad for the last six years may be cited. Since 1868 there has been a general increase in the weight of trains, by reason of the addition of sleeping-cars, postal cars, and by the introduction of other improvements in passenger-cars conducing to either the safety or convenience of the passengers. The Westinghouse brake, the Miller platform, the six-wheel trucks in the place of the four-wheel, and the addition of saloons, with lavatories, in the regular passenger-cars, have greatly added to the weight of passenger - trains. Not only on this account, but also on account of increasing the facilities of travel, to secure connections with other roads more trains have had to be run. The effect upon the cost of operating the road will be seen from the following comparison between the results of the operation in 1869 and in 1873 :

Average daily trains over road in 1869............................   4.53
Average daily trains over road in 1873...........................   5.55

  Increase 1.02

Number of miles run by passenger-trains in 1869............   305,761
Number of miles run by passenger-trains in 1873............   375,045

  Increase   69,284

No. of tons of gross weight, exclusive of locomotive, 1869.. 30,457,026
No. of tons of gross weight, exclusive of locomotive, 1873.. 42,166,291

  Increase 11,709,265

Cost per ton of gross weight in 1869 ....   1.44 cts.
Cost per ton of gross weight in 1873 ....   1.27 cts.

  Reduction of cost per ton ....   0.17 cts.

Total operating expenses, passenger, in 1869 .....,............ 439,523 46
Total operating expenses, passenger, in 1873 .... 533,696 69

  Increase $94,173 23

Included in this sum is a portion of the constant expenditure, which would have been incurred had the additional train mileage not been made. To estimate the additional cost merely, we have the increased passenger - train mileage 69,284, cost per mile 66.7601 cents, or total additional cost $46,254.06.

Before proceeding further in the investigation of the cost of passenger traffic, it may be advisable to recapitulate the results so far obtained. We have ascertained :

1. The cost of transportation of passengers, mail, and express on two roads—the Main Stem and the Knoxville Branch of the Louisville & Nashville Railroad—on the basis of the average cost per gross ton hauled (pages 23–25).

2. The cost of hauling an additional car per mile (a sleeping-car) in the trains of the Main Stem, supposing that this car could be hauled without increase in the power of the locomotive.

3. The effect of the increase of the weight of the train under such circumstances upon the average cost per gross ton.

4. The cost per mile run of an additional car, supposing that the power of the locomotive has to be increased.

5. The cost of using an additional locomotive, on account of the increased weight of the train.

6. The additional cost of running a passenger-train per mile.

7. The cost of increased passenger-train mileage per year.

From these investigations we have learned that the hauling of an additional car on a train may under certain circumstances involve a comparatively small, and under others a very large expenditure ; we have also seen that the average cost per gross ton, taking the whole weight of the train, can not always be used as a basis of computing the cost of any special service ; and we have further seen the distinction which must be made between the *average cost* (including all the expenditures incident to railroad operation) and the *additional cost* (exclusive of the constant expenditures) of certain services.

It may be and sometimes is claimed that because additional service could be performed on passenger - trains under certain circumstances for less than the average cost, that the parties

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desiring such service should derive the benefit therefrom. It could, however, readily be shown that if all parties using the trains of railroad companies would make and could sustain such a claim—and there is no reason why one is not as much entitled to it as another—the operation of railroads would be rendered thereby impossible.

The investigation has no doubt led the careful reader to the conclusion that the problem of ascertaining the cost of pas-senger-train service is rather a complicated one, not admitting of the establishment of general rules applicable to all cases that in practice may arise. I have merely endeavored to point out the elements which bear on this subject, and to illustrate it by the experience of the Louisville & Nashville Railroad.

We will now proceed to investigate

The Cost of the Mail and Postal Service

which the railroad companies of this country are required to perform, and the principle on which compensation should be and is being made.

On this subject a great difference of opinion exists between railroad companies and the Post-office Department, which is not to be wondered at when we bear in mind how great a difference exists in the cost of transportation on different roads. Regard-less of this, compensation is regulated by act of Congress, and is based upon the net weight of mail carried, and not upon the manner in which it is carried—an important item in the cost of the service, as will be more fully explained hereafter. It may therefore happen, and it does happen, that the mail service on some roads is a source of profit, while on others it is performed at a loss; hence while some companies complain, others are perfectly satisfied.

The service required of the railroad companies may be classi-fied as follows:

1. Mail carried in a postal car, properly furnished, in charge of a number of clerks attending to its distribution, a service formerly performed at the several post-offices.

2. Mail carried in apartments in the baggage-car of various sizes, in charge of route-agents, who attend to its assortment and distribution.

3. Mail carried in baggage-cars, in charge of the baggage-master, who performs the service of a route-agent in receiving and delivering the mail at stations on the route.

4. Mail carried in baggage - cars, like baggage or express, delivered and received only at the principal or terminal stations of the route.

The cost of carrying one ton of mail matter must necessarily vary much according to the special modes in which it is carried.

In order to ascertain the cost of the service and the proper compensation based on this cost, it is necessary to know—1. The weight of the mail matter, together with the weight of the agents ; 2. The *dead* weight carried on account of the mail and the agents ; 3. The cost per ton of carrying dead and net weight, with the addition of a reasonable profit.

In what follows I propose to make an estimate of the compensation that should be allowed for the different mail services before enumerated. This estimate will be based upon a cost of 1.33 cents, 1.66 cents, and 2 cents per ton per mile of gross weight, embracing nearly the variation of cost on roads as far as they have come under our observation. To the cost is added 50 per cent. for profit, which would make the net revenue derived from the mail service 33⅓ per cent. of the gross revenue—about an average of net earnings on American railroads. Accordingly the calculations are based on 2 cents, 2.5 cents, and 3 cents per ton per mile of gross weight carried.

1. *Postal Car Service.*—The following statements show the estimated compensation for running postal cars. Column 1 shows the length of cars ; 2, the weight;* 3, the net weight of

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* The weight of a postal car on the Pennsylvania Railroad, forty-six feet long, is 36,300 pounds. (See Proceedings of Select Committee on Transportation, April 8, 1873, in New York, pages 89 and 147.) This weight has been made the basis of the estimate of weight of cars as shown in column 2.

The cars from forty to fifty feet in length are supposed to have four-wheel and the sixty-foot cars six-wheel trucks. The weight of a six-wheel truck on the Louis-

the mail, which is estimated from 1 to 1.6 tons in each car, the usual amount carried ; 4, the weight of agents, from three to five in each car ; and the remaining columns as indicated under the respective headings.

LENGTH OF CAR.	WEIGHT OF				AT 2 CENTS PER TON.		AT 2.50 CENTS PER TON.		AT 3 CENTS PER TON.	
	Car.	Mail.	Ag'ts	Total	Per Mile.	Per Year.	Per Mile.	Per Year.	Per Mile	Per Year.
	Tons.	Tons.	Tons.	Tons.	Cents.		Cents.		Cents.	
40 feet	16.85	1.00	0.225	18.075	36.15	$226 30	45 19	$282 89	54 23	$339 48
45 feet	18 00	1.20	0 225	19.425	38.85	243 23	48.56	303 98	58.27	364 77
50 feet	20.00	1.40	0.300	21.700	43.40	271 68	54.25	339 60	65.10	407 52
60 feet	26.50	1.60	0.375	28.475	56.95	356 50	71.19	445 65	85.43	534 79
1	2	3	4	5	6	7	8	9	10	11

From this table we derive the following results in regard to the compensation for mail service in postal cars when based upon the net ton of mail, the weight being as assumed in column 3 :

LENGTH OF CAR.	PER TON OF NET WEIGHT.		
	At 2 cents per ton of gross w't.	At 2.5 cents per ton of gross w't.	At 3 cents per ton of gross w't.
	Cents.	Cents.	Cents.
40 feet	36.15	45.19	54.23
45 feet	32.37	40.47	48.56
50 feet	31.00	38.75	46.50
60 feet	35.59	44.49	53.39

To show how little influence the weight of mail matter carried in postal cars has upon the cost of performing the service, we will assume that in a postal car forty feet long, instead of one ton of mail, only one half ton be carried. The compensation (based on cost) per mile run of postal car should be, at the rate of 2 cents per ton of gross weight, $(16.85+0.5+0.225)$ $\times 2 = 35.15$ cents, being nearly the same as if one ton was carried (36.15 cents) ; instead of which, if compensation was

ville & Nashville Railroad is 9,800 pounds, a four-wheel truck 6,850 pounds— making a difference of three tons in the weight of cars with four-wheel and six-wheel trucks.

based on the amount of mail matter carried, it should be 70.30 cents per ton, or nearly twice as much as before.

2. *Mail Service in Apartments of Baggage-car.*—The following statement shows an estimate of compensation based on cost for that class of service. Column 1 gives the length of the apartment used for mail purposes ; 2, the corresponding weight (the total weight of a baggage-car fitted to carry mail, express, and baggage, length fifty feet, six-wheel trucks, is twenty-two tons ; see Table VIII). Column 3 shows the net weight of mail, estimated from a quarter of a ton to one ton ; 4, the weight of the route-agent (no route-agent is estimated for in the five-foot apartment). Columns 6, 8, and 10 show the estimated compensation per mile run, and columns 7, 9, and 11 the same per year of 313 days, both ways.

LENGTH OF APARTMENT.	WEIGHT OF				AT 2 CENTS PER TON.		AT 2.50 CENTS PER TON.		AT 3 CENTS PER TON.	
	Apartment.	Mail.	Agent	Total.	Per Mile.	Per Year.	Per Mile.	Per Year.	Per Mile.	Per Year.
	Tons.	Tons.	Tons.	Tons.	Cents.				Cents.	
5 feet..........................	2.20	0.25	....	2.450	4.90	$30 67	6.12	$38 31	7.35	$46 01
10 feet..........................	4.40	0.50	0.075	4.975	9.95	62 29	12.44	77 87	14.93	93 46
15 feet...........................	6.60	0.75	0.075	7.425	14.85	92 96	18.56	116 18	22.27	139 41
20 feet..........................	8.80	1.00	0.075	9.875	19.75	123 63	24.68	154 49	29 62	185 42
1	2	3	4	5	6	7	8	9	10	11

From this statement we derive the following results in regard to compensation for mail service in apartment of baggage-cars, the amount of mail and size of apartment as assumed in columns 1 and 3 :

LENGTH OF APARTMENT IN CAR.	PER TON OF NET WEIGHT.		
	At 2 cents per gross ton.	At 2.5 cents per gross ton.	At 3 cents per gross ton.
	Cents.	Cents.	Cents.
5 feet....................................	19.60	24.48	29.40
10 feet....................................	19.90	24.88	29.86
15 feet....................................	19.80	24.74	29.69
20 feet....................................	19.75	24.68	29.62

Should we, however, vary the weight of the mail as shown in column 3, and assume only one half to be carried in the same

apartment of the baggage-car, we will find that the cost of the service performed as measured by the mile run would be nearly the same, while the cost per net ton per mile would be doubled; showing that the net weight of the mail is no criterion of the cost of the service. On the contrary, the space occupied in the baggage-cars and the corresponding dead weight (to which is to be added the average net weight) would be the proper basis for computation.

3. *When mail matter is carried in charge of the baggage-master* acting as a route-agent, receiving and delivering, it is more difficult to ascertain the exact cost of the service than in the two preceding cases. Or unimportant routes only, where the weight of the mail perhaps does not exceed 200 pounds per day, is this mode of carrying mail adopted. A certain amount of room is required (besides the service of the baggage-master) to transact this business, independent of the weight of the mail, but how much is more a matter of judgment than of measurement. I have assumed that up to a quarter of a ton of mail matter a space of five feet of the length of the baggage-car might be allowed for the mail service, and on this basis the compensation for the service has been estimated as shown in the two preceding statements.

4. *When mail is carried like express matter* it is still more difficult to ascertain how much space in the baggage-car is actually used for that purpose. We have seen before that one ton of mail matter may be put in a space occupying four feet of the length of the baggage-car. An estimate of the cost upon this basis (the four feet of the baggage-car weighing 1.76 tons, mail 1 ton, total gross weight 2.76 tons), at 2 cents, 2.5 cents, and 3 cents, would be respectively 5.52 cents, 6.90 cents, and 8.28 cents per ton per mile. But this estimate presupposes that the ton of mail is carried over the whole length of the route and also on the return trip.

Compensation can not be based upon the actual weight for the actual distance carried, but upon the weight of the portion of the car required to receive the largest amount of mail at any

one time, and for which accommodation must always be in readiness. In order to comply with this requirement of the service, a large amount of dead weight without a corresponding load has often to be carried. In this respect the business transacted on passenger-trains materially differs from that on freight-trains. Freight-cars can always be fully loaded, at least going in one direction. Nor is it necessary to run freight-trains except when there is a full load for them ; while passenger-trains with a certain number of cars have to be sent out at regular times (often with a special regard to the mail service), whether there is a load or not. On this account, apart from the increased cost caused by greater speed, the service on passenger-trains is greatly increased over that on freight-trains, and the cost of carrying freight can not be made the basis of compensation for carrying mail or express on passenger-trains.

The cost of transportation on passenger-trains depends much more on the amount of dead weight carried on account of any special service than on the net weight and the actual distance it is carried. In determining the cost of the class of mail service under consideration it is therefore necessary to observe the largest amount of space required on account of it in the car at any one time, and compensation should be based on the corresponding dead weight and the average net weight, and not upon net weight alone. A ton of mail or express matter can be transported, as we have seen, under favorable conditions, for 5.52 cents per mile (including profit) ; but under the ordinary conditions of the service—for example, on the Main Stem of the Louisville & Nashville Railroad—the actual cost is 11.10 cents for mail carried in baggage-car, and for express it is 14.17 cents.

In the foregoing I have endeavored to establish a proper basis on which the compensation for mail service ought to be regulated. It may be necessary to remark here that it is not the intention to determine what should be the exact amount of compensation in any one case, but merely to ascertain and illustrate the principles on which the cost of the service should be ascertained.

In these computations we have had to assume the net weight of the mail, and to estimate the necessary dead weight as well as the cost of carrying one ton per mile of gross weight. If variations occur in these particulars, the result will of course vary; but as the conditions assumed are, as far as my observation extends, those under which the mail service is generally performed, it is believed that the computation will apply to a large majority of roads.

The conclusions to which this investigation has led may be summed up thus :

1. The cost of transportation on different roads and under different circumstances varies. The compensation, if cost is to be made the basis, should be regulated with a view to this difference.

2. The cost of transportation is not so much dependent on the net weight of the mail as upon the mode in which it is carried ; and hence the accommodations furnished, measured by the gross weight, should be made the proper basis for compensation.

We will now endeavor to point out in what particulars the present law (of March 3, 1873) governing compensation for mail service comes in conflict with these principles. The following shows the rates fixed by law :

1 WEIGHT OF MAIL.	2 Compensation per Year per Mile of Road	3 Compensation per Ton per Mile, 313 Days	4 Length of Postal Car, in feet	5 Addit'nal Compensation per Year for Postal Car per mile of Road
200 pounds	$50 00	$1 60	....	....
500 "	75 00	96	....	....
1,000 "	100 00	64	....	....
1,500 "	125 00	53	....	....
2,000 "	150 00	48	40	$25 00
3,500 "	175 00	32	45	30 00
5,000 "	200 00	25	50	40 00
For every additional 2,000 pounds	25 00	08	60	50 00

A few comparisons will bring out the striking differences existing between the compensation as determined by law and as computed on basis of cost. According to the former, a road that carries one ton of mail receives $150 per mile of road per year, or 48 cents per ton per mile, no matter whether this mail is carried in charge of the baggage-master in a space of four feet in the baggage-car, or in a space of twenty feet in charge of a route - agent ; but if carried in a postal car, four cents additional per ton per mile are allowed.

The following statement shows at a glance the variation in compensation per law and according to the cost of the service :

	In Baggage-car same as Ex-press Matter.	In 20-ft. Apart-ment with Route-agent.	In Postal Car.
According to law per mile of road	$150 00	$150 00	$175 00
According to cost (at 2 cents per ton).........	34 55	123 63	226 30
According to law per ton per mile..............	48.00 cents.	48.00 cents.	52.00 cents.
According to cost (at 2 cents per gross ton)...	5.52 cents.	19.75 cents.	35.59 cents.

It must be borne in mind in making the comparison that in the estimate of compensation according to cost only the relative value of the service performed is shown. The estimate is based on the assumption that one ton of mail is carried in three different modes. If only one half of a ton was carried in the same car-space, the cost of the service in each case would be nearly the same, while the cost per ton per mile would be very nearly doubled, but the relative cost of the three different modes in which the mail is carried would not be changed ; and to this particular point we wish to call attention, the law allowing nearly the same compensation in each case, while the cost is as 5.52 cents, 19.75 cents, and 35.59 cents.

To illustrate further the operation of the present law, and bearing in mind that according to it compensation is based on net weight for *the actual distance carried*, we will suppose a road of one hundred miles in length which takes at the starting-point one ton of mail in a twenty-foot apartment of a baggage-car,

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but delivers the same along the route, say an equal amount at equal distances, and arrives at the terminal station without any mail. On the return trip the same weight of mail is supposed to be carried in the same manner. This road is compensated for carrying one ton of mail over its entire length at the rate of $100 per mile per year.

Now suppose on another road of the same length the train starts with the same amount of mail (in an apartment of the baggage-car of the same size), but carries it over the whole length of the route, and also on the return trip. This road is compensated for carrying two tons of mail daily over the whole length of the route at the rate of $175 per mile of road. The cost of the service performed is very nearly the same (at the rate of 1.33 cents per ton per mile there is a reduction of $313 \times 1.33 = \$4.16$ per year), but the increase in compensation is $75.

This great difference between cost and compensation is the result of basing the latter upon the net weight of the mail for the *actual distance carried,* while in reality these elements do not influence the cost of the service materially.

Nor does the law make any provision in case the mail is carried in more than one train. The compensation is the same whether accommodations for the service have to be provided on one or five trains.

It is not necessary to pursue this subject further to show that under the operation of this law compensation can not be made in accordance with the cost of the service. If proper in one case, it must necessarily be excessive in another, or the reverse.*

The law might have been a proper one at the time mail was carried exclusively on stage-coaches or steamboats, or as baggage

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* I have confined the investigation to the cost of railroad transportation proper. There are other costs incurred on account of the mail service, such as in delivering and receiving mail at terminal and way-stations, to which no reference is made. These costs can only be ascertained correctly in each individual case; but forming, especially on short routes, a not inconsiderable portion of the whole cost, they should also be taken into account. If this be neglected, the revenue *of a short railroad* may be entirely absorbed by heavy terminal and way expenditures.

on railroads. Its operation, however, when applied to the railway and postal service of the present day can not but work injustice—whether to the railroad companies or to the Government we have not the means of determining, but quite as likely the one as the other. It disregards the fundamental principles bearing upon the cost of railroad transportation and the elements entering therein; and, evidently being based upon the experience obtained with former modes of mail service in character entirely different, its results upon the interests of either party can not be well predetermined.

This investigation has not been conducted with regard to advocating any particular interest. I entertain no doubt that the railroad companies desire nothing but a fair and just compensation for the services which they are required to render, no matter what the exact amount may be. Neither do I think that the United States Government desires to enforce unjust terms by the use of arbitrary powers, much less to place itself in the position of an applicant for free transportation over railroads. The present difficulties in the way of a just and final settlement of the question seem to arise more from the want of proper information as to what is just in the premises than from a disposition upon the one side to inflict wrong, or upon the other to exact exorbitant compensation. My sole purpose has been to present the facts and deduce the principles bearing on this question, with a view to its proper understanding. I may have gone more into detail than would seem necessary, but this has been done with a view to so present the subject to those interested that misapprehension of facts or errors in reasoning may be readily detected.

We may conclude this subject of mail service by expressing the opinion that it will be difficult to frame a general and inflexible law under which compensation could be justly regulated, even if such a law were framed by parties thoroughly conversant with the subject.

So varied are the requirements of the service and the conditions and circumstances under which they are performed

throughout a country so vast in extent, that even after principles should become well understood it would require discretion and judgment to apply the same in each particular case.

The power which assumes to enforce uniformity in compensation for railroad transportation should first be exercised to secure to all roads uniformity in the price of labor and material, uniformity in the grades and curvatures, uniformity in the cost of construction, and uniformity in the amount and character of business. These are the elements which control, as we have seen, the cost of railroad transportation. As long as *they* are permitted to exercise so diversified an influence, the enforcement of uniformity of compensation can not but be an act of injustice, either to the party rendering the service or to the party to whom it may be rendered.

TABLES.

I.—STATEMENT SHOWING COST OF RAILROAD TRANSPORTATION ON MAIN STEM, LOUISVILLE & NASHVILLE RAILROAD, DURING THE SEVEN YEARS FROM 1867 TO 1873.

No.	PASSENGER AND FREIGHT TRAINS.	1867.	1868.	1869.	1870.	1871.	1872.	1873.
1	Length of road in operation	185 miles.	185 miles.	185 miles.	185 miles.	185 miles.	185 miles.	185 miles.
2	Cost of road and equipment	$7,475,623 00	$7,517,511 00	$7,518,055 00	$7,585,886 00	$8,448,764 00	$8,762,806 00	$9,635,389 00
3	Cost of road per mile	40,408 77	40,635 19	40,638 14	42,734 52	45,669 00	47,366 52	52,083 18
4	Interest on cost of road and equipment, at 7 per cent	523,293 61	526,225 77	526,263 85	559,012 02	591,413 48	613,396 42	674,477 23
5	Operating expenses	1,045,519 19	1,008,592 24	1,013,574 71	1,362,250 71	1,532,341 02	1,480,096 29	1,780,673 26
6	Operating expenses, including interest	1,568,812 80	1,534,818 01	1,539,838 56	1,921,262 73	2,123,754 50	2,093,492 71	2,455,150 49
7	Percentage of interest (at 7 per cent) on cost of road to operating expenses	50.05 per ct.	52.17 per ct.	52.19 per ct.	41.03 per ct.	38.59 per ct.	41.44 per ct.	37.87 per ct.
8	Average number of passenger-trains per day over road	4.58	4.32	4.53	5.62	5.82	5.86	5.55
9	Average number of freight-trains per day over road	3.97	4.24	4.97	7.53	8.74	10.11	11.56
10	Total number of daily trains over road	8.55	8.56	9.50	13.15	14.56	15.97	17.11
11	Number of passenger-cars in each train	5.57	5.66	5.35	4.89	4.99	4.88	4.88
12	Number of freight-cars in each train	18.19	18.30	17.64	17.29	17.53	18.08	17.49
13	Number of train miles, passenger	399,063	291,986	305,761	379,289	393,126	396,139	375,045
14	Number of train miles, freight	268,367	286,044	335,732	568,694	590,344	682,563	780,572
15	Total number of train miles	577,430	578,030	641,493	887,981	983,470	1,078,702	1,155,617
16	Miles run by passenger-cars	1,001,680	981,819	898,755	954,783	1,065,400	1,068,498	930,228
17	Miles run by sleeping cars	189,279	170,279	238,708	281,780	293,684	285,841	375,342
18	Miles run by baggage-cars	322,881	291,504	304,482	357,951	355,699	338,152	301,861
19	Miles run by express-cars	268,504	210,270	194,953	128,737	117,013	124,892	113,594
20	Miles run by postal cars				132,825	131,165	115,810	111,556
21	Total mileage of cars in passenger-trains	1,782,344	1,653,872	1,635,998	1,856,076	1,962,961	1,933,193	1,832,581
22	Number of miles run by cars in freight-trains, loaded	3,620,068	4,145,768	4,628,807	6,844,787	7,929,476	8,797,426	10,519,311
23	Number of miles run by cars in freight-trains, empty	1,260,324	1,088,039	1,290,225	1,952,627	2,408,359	3,538,430	3,147,956
24	Total mileage of cars in freight-trains	4,880,392	5,233,807	5,919,032	8,797,414	10,337,835	12,335,856	13,667,267
25	Cost per mile per car in passenger-trains	30.00 cents.	27.66 cents.	26.86 cents.	29.41 cents.	28.11 cents.	26.28 cents.	29.12 cents.
26	Cost per mile per car in passenger-trains, including interest	45.02 cents.	42.09 cents.	40.88 cents.	41.48 cents.	38.96 cents.	37.17 cents.	40.15 cents.
27	Cost per mile per car in freight-trains, loaded and empty	10.85 cents.	10.53 cents.	9.59 cents.	9.28 cents.	9.48 cents.	7.88 cents.	9.12 cents.
28	Cost per mile per car in freight-trains, including interest	16.28 cents.	15.92 cents.	14.75 cents.	13.09 cents.	13.14 cents.	11.14 cents.	12.57 cents.
29	Passenger-train earnings	$807,617 11	$798,051 27	$780,839 44	$928,960 00	$917,434 71	$826,669 61	$793,636 72
30	Freight-train earnings	982,580 13	1,025,712 06	1,110,483 81	1,411,984 62	1,485,536 87	1,615,268 64	1,882,781 82
31	Total train earnings	1,790,197 24	1,823,763 33	1,891,323 25	2,340,944 62	2,402,971 58	2,435,938 25	2,676,418 54
32	Earnings from miscellaneous sources, passenger	4,543 44	24,540 65	3,193 68	17,347 55	14,279 32	15,301 57	49,672 36
33	Earnings from miscellaneous sources, freight				18,509 84	88,748 52	87,273 46	72,742 22
34	Total earnings from miscellaneous sources	4,543 44	24,540 65	3,193 68	35,857 39	103,027 94	102,575 03	122,414 58
35	Earnings per mile of road	9,676 74	9,858 18	10,223 36	12,653 75	13,545 94	13,721 69	15,128 81
36	Net earnings, passenger	290,838 28	340,568 56	341,315 98	383,085 80	379,757 60	327,851 28	309,612 39
37	Net earnings, freight	453,339 77	474,602 53	536,432 95	595,608 11	593,900 80	730,565 71	708,547 47
38	Total net earnings	744,078 05	815,171 09	877,748 54	978,693 91	973,658 40	1,058,416 99	1,018,159 86
39	Net earnings in excess of operating expenses and interest, passenger	324,190 48	101,899 83	111,928 69	159,113 62	166,757 44	117,286 59	107,501 46
40	Net earnings in excess of operating expenses and interest, freight	189,193 96	187,047 49	239,556 00	260,668 27	215,487 48	327,734 18	236,181 17
41	Total net earnings in excess of operating expenses and interest	221,384 44	288,945 32	351,484 69	419,681 89	382,244 92	445,020 57	343,682 63
42	Net earnings per mile of road	4,025 29	4,446 33	4,744 58	5,290 24	5,263 02	5,721 17	5,593 55

TABLE I] COST OF RAILROAD TRANSPORTATION. 3

No.								
43	Revenue from passengers per mile carried	3.814 cents	3.967 cents	3.901 cents	3.774 cents	3.739 cents	3.615 cents	3.481 cents
44	Revenue from freight per ton per mile	4.075 cents	4.072 cents	3.273 cents	3.000 cents	2.532 cents	2.268 cents	2.177 cents
45	Dead weight of one passenger-train, exclusive of locomotive	92.32 tons	93.23 tons	92.16 tons	94.90 tons	99.18 tons	98.40 tons	105.76 tons
46	Dead weight of one freight-train, exclusive of locomotive	145.48 tons	146.38 tons	141.90 tons	147.00 tons	148.83 tons	153.62 tons	148.70 tons
47	Gross weight of one passenger-train, exclusive of locomotive	99.95 tons	100.78 tons	99.67 tons	101.89 tons	106.06 tons	104.74 tons	112.43 tons
48	Gross weight of one freight-train, exclusive of locomotive	235.34 tons	234.44 tons	241.74 tons	238.29 tons	248.22 tons	257.95 tons	259.45 tons
49	Operating expenses, passenger	$516,778 83	$457,482 71	$439,523 46	$545,874 20	$551,956 88	$508,819 90	$533,696 69
50	Operating expenses, freight	528,740 36	551,109 53	574,951 25	816,376 51	980,384 14	971,976 39	1,246,976 57
51	Operating expenses per mile of road	5,051 45	5,451 85	5,478 78	7,363 51	8,282 92	8,000 52	9,625 26
52	Operating expenses per train mile, passenger	1 67	1 56	1 44	1 43	1 40	1 28	1 42
53	Operating expenses per train mile, freight	1 97	1 92	1 71	1 60	1 66	1 42	1 59
54	Number of passengers carried one mile	18,454,850	16,951,202	17,257,886	20,983,121	21,529,385	19,567,448	19,468,730
55	Number of passengers carried in one train	86.34	83.26	81.16	82.93	79.04	70.52	72.76
56	Number of passengers carried in one car	15.50	14.71	15.17	16.96	15.84	14.45	14.91
57	Cost per passenger per mile, without baggage	2.02 cents	1.97 cents	1.83 cents	1.81 cents	1.85 cents	1.89 cents	2.03 cents
58	Dead weight carried in passenger-trains, passenger-cars, tons	16,227,216	15,595,412	14,228,169	17,138,354	19,123,930	19,500,088	17,674,332
59	Dead weight carried in passenger-trains, sleeping-cars, tons	4,371,975	4,256,975	6,445,116	8,171,620	9,397,888	9,146,912	12,010,944
60	Dead weight carried in passenger-trains, baggage-cars, tons	5,488,977	4,955,568	5,176,194	6,085,167	6,046,900	6,171,274	6,052,104
61	Dead weight carried in passenger-trains, express-cars, tons	2,085,940	2,102,700	2,328,636	1,544,844	1,404,156	1,498,704	1,363,128
62	Dead weight carried in passenger-trains, postal cars, tons				3,054,975	3,016,795	2,663,630	2,565,788
63	Total dead weight in passenger-trains, tons	28,533,208	27,220,655	28,178,115	35,994,960	38,989,669	38,980,608	39,666,296
64	Paying weight carried, at 150 lbs, per passenger, tons	1,384,114	1,271,340	1,294,342	1,573,734	1,014,704	1,407,559	1,460,155
65	Paying weight carried, at 50 lbs, baggage per passenger, tons	451,371	423,780	431,447	524,578	538,234	480,186	486,718
66	Paying weight, express, carried in one mile, tons	422,326	422,326	422,326	422,326	422,326	422,326	422,326
67	Paying weight, mail, carried in one mile, tons	89,065	89,065	130,796	130,796	130,796	130,796	130,796
68	Total tons paying weight carried one mile	2,356,876	2,206,511	2,278,911	2,651,434	2,706,060	2,509,867	2,499,995
69	Total tons paying and dead weight carried one mile	30,890,084	29,427,166	30,457,026	38,646,394	41,695,729	41,499,475	42,166,291
70	Percentage of paying to dead weight	8.26 per ct.	8.11 per ct.	8.09 per ct.	7.37 per ct.	6.94 per ct.	6.44 per ct.	6.30 per ct.
71	Cost per ton per mile of gross weight, passenger	1.67 cents	1.56 cents	1.44 cents	1.41 cents	1.32 cents	1.23 cents	1.27 cents
72	Interest (at 7 per cent.) on cost of road per ton per mile	0.84 cents	0.81 cents	0.75 cents	0.58 cents	0.51 cents	0.51 cents	0.48 cents
73	Cost per ton gross weight, including interest	2.51 cents	2.37 cents	2.19 cents	1.99 cents	1.83 cents	1.74 cents	1.75 cents
74	Cost per ton per mile net weight, passenger	21.93 cents	20.73 cents	19.29 cents	20.59 cents	20.40 cents	20.24 cents	21.35 cents
75	Cost per ton per mile net weight, including interest	32.90 cents	31.54 cents	29.35 cents	29.03 cents	28.27 cents	28.62 cents	20.43 cents
76	Number of tons freight carried one mile South	16,393,691	15,070,261	19,668,473	29,772,825	37,102,953	48,363,747	51,896,162
77	Number of tons freight carried one mile North	7,810,020	10,120,181	14,149,946	16,664,833	21,569,012	22,848,424	34,581,650
78	Total number of tons carried one mile	24,113,711	25,190,442	33,809,419	46,437,658	58,671,965	71,212,171	86,477,812
79	Number of tons paying weight carried in one train	89.85	88.06	100.70	91.29	99.39	104.33	110.75
80	Number of tons paying weight carried in one loaded car	6 66	6 08	7 30	6 78	7 40	8 09	8 22
81	Average number of tons paying weight carried in each car	4 94	4 81	5 71	5 28	5 67	5 77	6 33
82	Percentage of North to South tonnage	-47.90 per ct.	-67.14 per ct.	-71.84 per ct.	-55.97 per ct.	-58.13 per ct.	-47.24 per ct.	-66.63 per ct.
83	Cost per ton of freight per mile	2.19 cents	2.27 cents	1.69 cents	1.75 cents	1.67 cents	1.36 cents	1.44 cents
84	Interest (at 7 per cent.) on cost of road per ton per mile	1.14 cents	1.10 cents	0.88 cents	0.75 cents	0.65 cents	0.57 cents	0.55 cents
85	Cost per ton of freight per mile, including interest	3.33 cents	3.37 cents	2.57 cents	2.47 cents	2.32 cents	1.93 cents	1.99 cents
86	Tons dead weight carried one mile in freight-trains	39,043,136	41,870,456	47,352,356	74,778,019	89,871,597	104,854,776	116,171,769
87	Total tons paying and dead weight carried one mile	63,156,847	67,060,898	81,161,675	121,215,677	146,543,562	176,666,947	202,649,581
88	Cost per ton per mile gross weight, freight	0.837 cents	0.822 cents	0.797 cents	0.673 cents	0.669 cents	0.552 cents	0.615 cents
89	Cost per ton per mile gross weight, including interest	1.256 cents	1.251 cents	1.073 cents	0.949 cents	0.927 cents	0.781 cents	0.848 cents
90	Percentage of paying to dead weight, freight	61.76 per ct.	60.16 per ct.	71.40 per ct.	62.10 per ct.	66.76 per ct.	67.92 per ct.	7444 per ct.

II.—STATEMENT SHOWING COST OF RAILROAD TRANSPORTATION ON KNOXVILLE BRANCH,

LOUISVILLE & NASHVILLE RAILROAD, DURING THE SEVEN YEARS FROM 1867 TO 1873.

No.	PASSENGER AND FREIGHT TRAINS.	1867.	1868.	1869.	1870.	1871.	1872.	1873.
1	Length of road in operation	85 miles.	88 miles.	94 miles.	99.3 miles.	110.32 miles.	110.32 miles.	110.32 miles.
2	Cost of road and equipment	$2,956,981 00	$3,609,832 00	$4,031,635 00	$4,253,654 00	$4,292,702 00	$4,309,960 00	$4,396,249 00
3	Cost of road per mile	34,788 00	41,021 00	42,889 00	42,836 00	38,911 00	39,068 00	39,850 00
4	Interest on cost of road and equipment at 7 per cent	206,988 67	252,688 24	282,214 45	297,755 78	300,489 14	301,697 20	307,737 43
5	Operating expenses	141,130 05	132,879 47	146,658 47	173,810 06	233,665 53	227,382 82	309,481 67
6	Operating expenses, including interest	348,118 72	384,968 21	428,872 92	471,565 84	534,154 67	529,080 02	617,219 10
7	Percentage of interest at 7 per cent. on cost of road to operating expenses	146.66 per ct.	191.03 per ct.	192.43 per ct.	171.37 per ct.	128.59 per ct.	132.65 per ct.	99.44 per ct.
8	Number of passenger-trains per day over road	1.71	1.64	1.59	1.73	1.69	1.71	1.69
9	Number of freight-trains per day over road	1.10	0.89	1.10	1.88	1.85	2.27	3.09
10	Total number of daily trains over road	2.81	2.53	2.69	3.61	3.54	3.98	4.78
11	Number of passenger-cars in each train	4.05	3.91	4.02	4.47	3.91	3.75	3.77
12	Number of freight-cars in each train	11.37	12.42	14.50	11.51	14.34	17.17	13.53
13	Number of train miles, passenger	52,956	55,494	57,960	63,018	68,078	69,119	68,118
14	Number of train miles, freight	34,182	30,019	39,999	68,137	74,301	91,578	124,555
15	Total number of train miles	87,138	85,513	97,959	131,155	143,379	160,697	192,673
16	Miles run by passenger-cars	155,649	138,168	169,131	170,174	178,474	184,313	187,105
17	Miles run by baggage-cars	52,320	59,148	55,645	60,352	62,473	68,547	67,860
18	Miles run by express-cars	7,003	8,670	8,648	38,771	25,366	6,820	
19	Total mileage of cars in passenger-trains	214,972	216,986	233,424	269,297	266,313	259,680	254,965
20	Miles run by cars in freight-trains, loaded	259,708	266,341	411,978	518,923	668,097	904,128	980,655
21	Miles run by cars in freight-trains, empty	128,901	106,407	167,989	265,310	397,708	669,128	704,035
22	Total mileage of cars in freight-trains	388,609	372,748	579,967	784,233	1,065,805	1,573,256	1,684,690
23	Cost per mile per car in passenger-trains	37.12 cents.	35.30 cents.	34.57 cents.	29.15 cents.	37.52 cents.	34.17 cents.	40.98 cents.
24	Cost per mile per car in passenger-trains, including interest	91.56 cents.	102.73 cents.	101.09 cents.	79.08 cents.	85.76 cents.	79.49 cents.	81.73 cents.
25	Cost per mile per car in freight-trains, loaded and empty	15.78 cents.	14.93 cents.	11.37 cents.	12.15 cents.	12.54 cents.	8.81 cents.	12.17 cents.
26	Cost per mile per car in freight-trains, including interest	38.92 cents.	43.45 cents.	33.24 cents.	32.96 cents.	28.66 cents.	20.49 cents.	24.27 cents.
27	Passenger-train earnings	$93,838 95	$98,444 36	$113,273 00	$124,120 17	$120,681 11	$110,146 58	$108,958 03
28	Freight-train earnings	94,768 20	86,965 91	120,506 76	159,758 84	174,960 68	193,317 05	210,653 27
29	Total train earnings	188,607 15	185,410 27	233,779 76	283,879 01	295,641 79	303,463 63	319,611 30
30	Earnings from miscellaneous sources, passenger	501 38	591 97	541 97	495 96	437 10	419 61	181 65
31	Earnings from miscellaneous sources, freight		107 09		45 00			192 65
32	Total earnings from miscellaneous sources	501 38	699 06	541 97	540 96	437 10	419 61	374 30
33	Earnings per mile of road	2,224 80	2,114 87	2,492 77	2,864 24	2,683 82	2,754 56	2,900 52
34	Net earnings, passenger	14,537 96	22,427 47	33,110 70	45,096 87	20,752 29	21,391 81	4,661 64
35	Net earnings, freight	33,440 52	31,401 89	54,553 56	64,513 04	41,661 07	54,689 00	5,842 29
36	Total net earnings	47,978 48	53,829 36	87,663 26	110,609 91	62,413 36	76,080 81	10,503 93
37	Operating expenses and interest in excess of earnings, passenger, net loss	102,504 19	124,018 43	122,188 08	88,414 47	107,754 81	96,391 39	99,221 32
38	Operating expenses and interest in excess of earnings, freight, net loss	50,506 00	74,840 45	72,363 11	98,731 40	139,320 97	128,805 39	198,012 18

TABLE II]   COST OF RAILROAD TRANSPORTATION.   5

#	Item							
41	Operating expenses and interest in excess of earnings, total loss	159,010 19	198,858 88	194,551 19	187,145 87	238,075 78	225,196 78	297,233 50
42	Net earnings per mile of road	564 45	611 69	932 58	1,113 89	565 75	693 44	95 21
43	**Revenue from passengers per mile carried**	3.729 cents	4.050 cents	4.025 cents	3.974 cents	3.881 cents	3.690 cents	3.428 cents
44	**Revenue from freight per ton per mile**	4.480 cents	5.350 cents	4.570 cents	3.730 cents	3.800 cents	3.159 cents	2.460 cents
45	Operating expenses, passenger	$79,802 37	$76,608 86	$80,704 27	$78,519 26	$99,928 82	$88,754 77	$104,478 04
46	Operating expenses, freight	61,327 68	55,671 11	65,954 20	95,290 80	133,736 71	138,628 05	205,003 63
47	Operating expenses per mile of road	1,660 35	1,593 18	1,560 19	1,750 35	2,118 07	2,061 12	2,805 31
48	**Operating expenses per train mile, passenger**	1 50	1 38	1 39	1 24	1 47	1 28	1 53
49	**Operating expenses per train mile, freight**	1 79	1 85	1 65	1 40	1 80	1 51	1 64
50	Number of passengers carried one mile	2,192,895	2,058,680	2,369,836	2,609,595	2,660,578	2,536,701	2,698,268
51	Number of passengers carried in one train	41 41	37 09	40 88	41 41	39 08	36 70	39 61
52	Number of passengers carried in one car	14 09	13 02	14 01	15 33	14 91	13 77	14 42
53	**Cost per passenger per mile without baggage**	2.542 cents	2.634 cents	2.448 cents	1.973 cents	2.668 cents	2.452 cents	2.716 cents
54	Dead weight carried in passenger-trains, passenger-cars, tons	2,490,384	2,530,688	2,875,227	3,063,132	3,212,533	3,364,712	3,461,442
55	Dead weight carried in passenger-trains, baggage-cars, tons	889,440	852,516	945,965	1,025,984	1,062,041	1,233,846	1,357,200
56	Dead weight carried in passenger-trains, express-cars, tons	70,030	86,700	103,726	465,252	304,392	81,840	
57	Total dead weight in passenger-trains, tons	3,449,854	3,469,904	3,924,968	4,554,368	4,578,965	4,680,398	4,818,642
58	Paying weight carried, at 150 pounds per passenger, tons	164,467	154,491	177,738	195,719	199,544	190,253	202,370
59	Paying weight carried, at 50 pounds baggage per passenger, tons	54,822	51,467	59,246	65,240	66,514	63,417	67,467
60	Paying weight, express, carried one mile, tons	126,432	126,432	126,432	126,432	126,432	126,432	126,432
61	Paying weight, mail, carried one mile, tons	2,932	3,035	3,242	3,860	4,288	4,288	4,288
62	Total paying weight carried one mile, tons	348,653	335,335	366,658	391,251	396,778	384,390	400,557
63	Total paying and dead weight carried one mile, tons	3,798,507	3,805,239	4,291,626	4,945,619	4,975,743	5,064,788	5,219,199
64	Dead weight of one passenger-train, exclusive of locomotive, tons	65.15	64.86	67.12	72.27	67.26	67.72	70.74
65	Gross weight of one passenger-train, exclusive of locomotive, tons	71.73	58.47	74.04	78.47	73.09	73.28	76.62
66	Percentage of paying to dead weight	10.11	9.66	9.34	8.60	8.66	8.21	8.31
67	Cost per ton per mile of gross weight, passenger	2.10 cents	2.02 cents	1.90 cents	1.58 cents	2.08 cents	1.75 cents	2.00 cents
68	Interest at 7 per cent. on cost of road per ton per mile	3.08 cents	3.86 cents	3.66 cents	2.71 cents	2.67 cents	2.33 cents	1.99 cents
69	**Cost per gross ton per mile, including interest**	5.18 cents	5.88 cents	5.56 cents	4.29 cents	4.75 cents	4.07 cents	3.99 cents
70	Cost per ton per mile net weight, passenger	22.88 cents	22.84 cents	22.01 cents	20.07 cents	25.18 cents	23.09 cents	26.08 cents
71	**Cost per ton per mile net weight, including interest**	56.43 cents	66.46 cents	64.36 cents	54.45 cents	57.55 cents	53.71 cents	52.01 cents
72	Number of tons of freight carried one mile South	734,862	888,699	1,342,376	1,339,187	1,389,942	1,086,523	1,247,705
73	Number of tons of freight carried one mile North	1,061,518	866,532	1,292,670	4,947,575	3,210,807	5,032,978	7,304,977
74	Total number of tons of freight carried one mile	1,796,380	1,755,231	2,635,046	4,277,762	4,600,809	6,119,501	8,552,682
75	Number of tons paying weight carried in one train	52.55	58.47	55.88	62.78	61.92	66.82	68.66
76	Number of tons paying weight carried in one loaded car	6.95	6.77	6.42	8.24	6.88	6.76	8.72
77	Average number of tons paying weight carried in each car	4.62	4.71	4.54	5.46	4.32	3.89	5.08
78	Percentage of North to South tonnage	144.45	97.51	95.55	221.59	231.01	463.21	585.47
79	**Cost per ton of freight per mile**	3.41 cents	3.42 cents	2.50 cents	2.23 cents	2.91 cents	2.26 cents	2.39 cents
80	Interest at 7 per cent, on cost of road per ton per mile	5.00 cents	6.53 cents	4.81 cents	3.82 cents	3.74 cents	3.00 cents	2.38 cents
81	**Cost per ton of freight per mile, including interest**	8.41 cents	9.95 cents	7.31 cents	6.05 cents	6.65 cents	5.26 cents	4.77 cents
82	Tons of dead weight carried one mile in freight-trains	3,108,872	2,981,984	4,639,736	6,665,980	9,059,343	13,372,676	14,319,865
83	Total tons of paying and dead weight carried one mile	4,995,252	4,737,215	7,274,782	10,943,742	13,669,152	19,492,177	22,872,547
84	Dead weight of one freight-train, exclusive of locomotive	90.95	99.33	115.99	97.79	121.79	146.24	114.97
85	Gross weight of one freight-train, exclusive of locomotive	143.50	157.80	181.87	160.57	183.71	213.07	183.63
86	Percentage of paying to dead weight	57.78	53.86	56.80	64.17	59.78	45.76	59.73
87	Percentage of paying to dead weight							
88								
89	**Cost per ton per mile gross weight**	1.25 cents	1.17 cents	0.91 cents	0.87 cents	0.98 cents	0.71 cents	0.81 cents
90	**Cost per ton per mile gross weight, including interest**	3.08 cents	3.41 cents	2.66 cents	2.36 cents	2.24 cents	1.65 cents	1.61 cents

III.—STATEMENT SHOWING COST OF RAILROAD TRANSPORTATION ON MEMPHIS BRANCH, LOUISVILLE & NASHVILLE RAILROAD, DURING THE FIVE YEARS FROM 1867 TO 1871.

No.	PASSENGER AND FREIGHT TRAINS.	1867.	1868.	1869.	1870.	1871.
1	Length of road in operation	46.4 miles.	46.4 miles.	46.4 miles.	46.4 miles.	46.4 miles.
2	Cost of road and equipment	$1,226,674 00	$1,233,126 00	$1,232,126 00	$1,291,448 00	$1,352,568 00
3	Cost of road per mile	26,437 00	26,554 00	26,554 00	27,833 00	29,150 00
4	Interest on cost of road and equipment, at 7 per cent	85,867 18	86,248 82	86,248 82	90,401 36	94,679 76
5	Operating expenses	137,385 99	146,088 13	135,521 09	220,855 44	265,681 82
6	Operating expenses, including interest	223,253 17	232,336 95	221,769 91	311,256 80	360,361 58
7	Percentage of interest (at 7 per cent.) on cost of road to operating expenses	62.50 per ct.	59.03 per ct.	63.64 per ct.	40.93 per ct.	35.63 per ct.
8	Number of passenger-trains per day over road	3.53	3.76	3.69	5.12	4.48
9	Number of freight-trains per day over road	1.49	2.03	2.97	4.42	5.41
10	Total number of daily trains over road	5.02	5.79	6.66	9.54	9.89
11	Number of passenger-cars in each train	3.76	3.64	4.19	3.80	3.91
12	Number of freight-cars in each train	13.68	15.76	12.22	12.32	14.01
13	Number of train miles, passenger	59,754	62,698	62,436	86,698	75,808
14	Number of train miles, freight	25,245	34,362	50,324	74,810	91,540
15	Total number of train miles	84,999	97,060	112,760	161,508	167,348
16	Miles run by passenger-cars	134,980	130,455	132,751	185,179	153,629
17	Miles run by sleeping-cars	29,704	33,074	62,782	67,908	73,791
18	Miles run by baggage-cars	48,853	63,567	64,233	64,931	59,750
19	Miles run by express-cars	11,218	1,719	2,301	12,834	9,764
20	Total mileage of cars in passenger-trains	224,755	228,815	262,067	339,952	296,934
21	Miles run by cars in freight-trains, loaded	252,074	413,718	512,468	771,815	1,060,541
22	Miles run by cars in freight-trains, empty	93,296	128,156	102,860	149,576	221,544
23	Total mileage of cars in freight-trains	345,370	541,874	615,328	921,391	1,282,085
24	Cost per mile per car in passenger-trains	40.56 cents.	37.40 cents.	27.55 cents.	33.87 cents.	37.35 cents.
25	Cost per mile per car in passenger-trains, including interest	65.91 cents.	59.47 cents.	45.08 cents.	47.73 cents.	59.65 cents.
26	Cost per mile per car in freight-trains, loaded and empty	13.38 cents.	11.16 cents.	10.29 cents.	11.83 cents.	12.07 cents.
27	Cost per mile per car in freight-trains, including interest	21.74 cents.	17.74 cents.	16.83 cents.	16.57 cents.	16.37 cents.
28	Passenger-train earnings	$90,603 93	$102,349 32	$108,122 02	$127,726 87	$132,923 03
29	Freight-train earnings	67,556 89	92,935 98	99,543 57	141,074 63	160,476 46
30	Total train earnings	158,160 82	195,285 30	207,665 59	268,801 50	293,399 49
31	Earnings from miscellaneous sources, passenger	449 31	399 96	399 96	311 33	....
35	Earnings per mile of road	3,447 98	4,254 02	4,523 16	5,850 28	6,327 35
36	Net earnings, passenger	Loss, 118 75	17,157 27	36,329 49	16,202 30	21,995 68
37	Net earnings, freight	21,339 89	32,439 86	30,214 97	31,995 09	5,721 99
38	Total net earnings	21,221 14	49,597 13	72,544 46	48,257 39	27,717 57
39	Operating expenses and interest in excess of earnings, passenger, net loss	57,099 35	33,367 69	9,631 81	29,487 57	17,527 73
40	Operating expenses and interest in excess of earnings, freight, net loss	7,545 17	3,270 99	4,087 35	12,651 16	49,417 02
41	Operating expenses and interest in excess of earnings, total loss	64,644 46	36,638 68	13,719 16	42,138 73	66,944 75

Table III]   COST OF RAILROAD TRANSPORTATION.   7

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42	Net earnings per mile of road	461 33	1,078 19	1,577 05	1,049 08	597 75
43	Revenue from passengers per mile carried	3,898 cents.	4,207 cents.	3,968 cents.	3,661 cents.	3,620 cents.
44	Revenue from freight per ton per mile	2.76 cents.	3.49 cents.	2.55 cents.	2.18 cents.	1.99 cents.
45	Operating expenses, passenger	$91,168 99	$35,592 01	$72,192 49	$111,775 90	$110,927 35
46	Operating expenses, freight	46,217 00	60,496 12	63,328 60	109,079 54	154,754 47
47	Operating expenses per mile of road	2,986 65	3,175 83	2,946 11	4,801 20	5,729 60
48	Operating expenses per train mile, passenger	1 52	1 36	1 16	1 29	1 46
49	Operating expenses per train mile, freight	1 83	1 76	1 25	1 46	1 69
50	Number of passengers carried one mile	2,040,219	2,120,844	2,381,003	3,048,438	3,180,556
51	Number of passengers carried in one train	34.14	33.82	38.13	35.16	41.95
52	Number of passengers carried in one car	9.08	9.29	9.10	9.25	10.73
53	Cost per passenger per mile, without baggage	3.206 cents.	2.773 cents.	2.254 cents.	2.852 cents.	2.736 cents.
54	Dead weight carried in passenger-trains, passenger-cars, tons	2,159,680	2,087,280	2,256,767	3,333,222	2,755,322
55	Dead weight carried in passenger-trains, sleeping-cars, tons	742,600	826,850	1,695,114	1,969,332	2,361,312
56	Dead weight carried in passenger-trains, baggage-cars, tons	790,501	1,680,639	1,091,961	1,088,527	1,015,750
57	Dead weight carried in passenger-trains, express-cars, tons	112,180	17,190	27,612	154,008	117,168
58	Total dead weight in passenger-trains, tons	3,804,961	4,011,959	5,071,454	6,545,089	6,259,552
59	Paying weight carried, at 150 lbs, per passenger, tons	153,016	159,063	178,575	228,632	238,541
60	Paying weight carried, at 50 lbs. baggage per passenger, tons	51,005	53,021	59,525	76,211	79,514
61	Paying weight, express, carried one mile, tons	243,732	243,732	243,732	243,732	243,732
62	Paying weight, mail, carried one mile, tons	4,302	4,302	4,302	16,707	16,707
63	Total paying weight carried one mile, tons	452,055	460,116	486,134	505,282	578,494
64	Total paying and dead weight carried one mile, tons	4,257,016	4,472,075	5,557,588	7,110,371	6,838,046
65	Dead weight of one passenger-train, exclusive of locomotive, tons	63.68	63.99	81.22	75.49	82.57
66	Gross weight of one passenger-train, exclusive of locomotive, tons.	71.24	71.36	89.33	82.01	90.20
67	Percentage of paying to dead weight	11.88	11.47	9.59	8.64	9.24
68	Cost per ton per mile of gross weight	2.141 cents.	1.914 cents.	1.299 cents.	1.572 cents.	1.622 cents.
69	Interest (at 7 per cent.) on cost of road per ton per mile, gross weight	1.338 cents.	1.129 cents.	0.826 cents.	0.643 cents.	0.577 cents.
70	Cost per gross ton per mile, including interest	3.479 cents.	3.043 cents.	2.125 cents.	2.215 cents.	2.199 cents.
71	Cost per ton per mile net weight	20.17 cents.	18.62 cents.	14.85 cents.	19.81 cents.	19.18 cents.
72	Cost per ton per mile net weight, including interest	32.78 cents.	29.61 cents.	24.30 cents.	27.92 cents.	26.01 cents.
73	Number of tons freight carried one mile North	765,579	718,904	2,148,212	3,730,058	4,414,684
74	Number of tons freight carried one mile North	743,392	718,904	1,752,545	2,728,532	3,654,505
75	Total number of tons freight carried one mile	1,508,971	2,179,788	3,900,757	6,458,590	8,069,189
76	Number of tons paying weight carried in one train	59.77	63.44	77.51	86.33	88.15
77	Number of tons paying weight carried in one loaded car	5.99	5.27	7.61	8.36	7.60
78	Average number of tons paying weight carried in each car	4.37	4.02	6.34	7.01	6.30
79	Percentage of North to South tonnage	97.12	49.21	81.58	73.15	82.78
80	Cost per ton of freight per mile	3.06 cents.	2.27 cents.	1.62 cents.	1.69 cents.	1.92 cents.
81	Interest (at 7 per cent) on cost of road per ton per mile	1.91 cents.	1.34 cents.	1.03 cents.	0.69 cents.	0.68 cents.
82	Cost per ton of freight per mile, including interest	4.97 cents.	3.61 cents.	2.65 cents.	2.38 cents.	2.60 cents.
83	Tons of dead weight carried one mile in freight-trains	2,702,960	4,334,992	4,922,624	7,831,823	10,897,727
84	Total tons of paying and dead weight carried one mile	4,271,931	6,514,780	8,822,381	14,290,413	18,966,916
85	Dead weight of one freight-train, exclusive of locomotive	109.45	126.18	97.82	104.68	119.05
86	Gross weight of one freight-train, exclusive of locomotive	169 32	189.62	175.33	191.01	207.20
87	Percentage of paying to dead weight	54.61	50.28	79.24	82.47	74.04
89	Cost per ton per mile gross weight	1.082 cents.	0.929 cents.	0.718 cents.	0.763 cents.	0.816 cents.
90	Cost per ton per mile gross weight, including interest	1.758 cents.	1.477 cents.	1.175 cents.	1.075 cents.	1.107 cents.

IV.—STATEMENT SHOWING COST OF RAILROAD TRANSPORTATION ON RICHMOND BRANCH, LOUISVILLE & NASHVILLE RAILROAD, DURING THE FIVE YEARS FROM 1869 TO 1873.

No.	MIXED TRAIN.	1869.	1870.	1871.	1872.	1873.
1	Length of road in operation	25.62 miles.	33.46 miles.	33.46 miles.	33.46 miles.	33.46 miles.
2	Cost of road and equipment	$786,645 00	$806,395 00	$816,418 00	$820,043 00	$830,186 00
3	Cost of road per mile	30,704 00	24,100 00	24,400 00	24,509 00	24,811 00
4	Interest on cost of road equipment, at 7 per cent	55,065 15	56,447 65	57,149 26	57,403 01	58,113 02
5	Operating expenses	22,648 80	33,434 78	44,878 22	32,331 72	30,242 44
6	Operating expenses, including interest	77,713 95	89,882 43	102,027 48	89,734 73	88,355 46
7	Percentage of interest at 7 per cent. on cost of road to operating expenses	243.12 per ct.	168.83 per ct.	127.34 per ct.	177.55 per ct.	192.15 per ct.
8	Total number of daily trains over road, passenger and freight mixed	1.91	3.00	3.62	2.77	1.82
10	Number of passenger-cars in each train	2.12	1.21	0.97	1.36	1.91
11	Number of freight-cars in each train	2.99	2.23	2.60	3.67	5.89
12	Total number of cars in each train	5.11	3.44	3.57	5.03	7.80
13	Number of train miles, passenger and freight mixed	23,351	36,744	44,237	33,756	22,230
15	Miles run by passenger-cars	37,305	42,156	42,800	42,269	42,510
16	Miles run by baggage-cars	12,066	2,022		3,583	
18	Miles run by express-cars	264	245			
19						
21	Total Mileage of passenger-cars	49,635	44,423	42,800	45,852	42,510
22	Miles run by freight-cars, loaded	42,842	55,657	67,160	71,541	89,650
23	Miles run by freight-cars, empty	26,876	26,099	47,705	51,336	41,423
24	Total mileage of freight-cars	69,718	81,756	114,865	122,877	131,073
25	Total number of miles run by passenger and freight cars in mixed trains	119,353	126,179	157,665	168,729	173,583
26	Cost per mile per car, passenger and freight, in mixed trains	18.98 cents.	26.49 cents.	28.47 cents.	19.17 cents.	17.42 cents.
27	Cost per mile per car, passenger and freight, in mixed trains, including interest	65.12 cents.	71.21 cents.	64.72 cents.	53.20 cents.	50.89 cents.
29	Train earnings from passengers	$11,156 67	$17,310 60	$18,133 91	$17,274 43	$16,688 58
30	Train earnings from freight	10,556 54	16,421 30	15,384 35	16,374 99	19,139 50
31	Total train earnings	21,713 21	33,731 99	33,518 26	33,649 42	35,828 08
32	Earnings from miscellaneous sources, passenger and freight	37 50	90 50	2 00	13 00	13 00
35	Earnings per mile of road	848 97	1,010 83	1,001 80	1,006 03	1,070 77
36	Net earnings, passenger	*3,348 97	1,527 48	*2,999 82	1,599 15	2,399 25
37	Net earnings, freight	2,450 88	*1,139 86	*8,360 14	*281 45	3,186 39
38	Total net earnings	898 09	387 62	*1,359 96	1,307 70	5,585 64
39	Operating expenses and interest in excess of earnings, passenger	39,115 08	25,258 44	29,911 51	26,232 30	25,957 69
40	Operating expenses and interest in excess of earnings, freight	17,384 27	30,801 87	38,596 37	29,854 95	27,467 51
41	Operating expenses and interest in excess of earnings, total	56,499 35	56,060 31	68,597 88	56,087 25	52,525 20
42	Net earnings per mile of road	35 06	11 58	*309 39	39 08	166 92
43	Revenue from passengers per mile carried	3.70 cents.	3.92 cents.	3.74 cents.	3 64 cents.	3.82 cents.
44	Revenue from freight per ton per mile	4.37 cents.	3.19 cents.	4.33 cents.	3.78 cents.	3.22 cents.
47	Operating expenses per mile of road	$884 02	$999 24	$1,341 25	$966 28	$903 83
48	Operating expenses per train mile	96.99 cents.	90.99 cents.	105.45 cents.	95.78 cents.	136.04 cents.

TABLE IV]   COST OF RAILROAD TRANSPORTATION.   9

No.						
50	Number of passengers carried one mile	368,049	402,670	410,644	391,861	269,056
51	Number of passengers carried in one train	16.55	11.93	9.28	10.66	11.52
52	Number of passengers carried in one car	8.66	9.53	9.59	9.21	7.20
53	Cost per passenger per mile, without baggage	2.65 cents.	2.73 cents.	4.07 cents.	2.29 cents.	3.31 cents.
54	Dead weight carried in trains, passenger-cars, tons	786,435	771,409	770.400	758,808	635,205
55	Dead weight carried in trains, baggage-cars, tons		64,494		34,374	204,102
56	Dead weight carried in trains, express-cars, tons				2,740	3,168
57	Dead weight carried in trains, freight-cars, tons	1,114,120	1,044,455	976,353	694,926	557,844
58	Total weight in trains, tons	1,900,555	1,880,358	1,746,753	1,490,848	1,400,319
59	Paying weight carried, at 150 pounds per passenger, tons	27,604	30,201	30,798	29,390	20,180
60	Paying weight carried, at 50 pounds baggage per passenger, tons	9,201	10,066	10,266	9,796	6,726
61	Paying weight, express, carried one mile, tons	3,408	3,408	3,408	3,408	3,408
62	Paying weight, mail, carried one mile, tons	940	940	940	940	940
63	Number tons freight carried one mile South	348,487	258,691	229,791	177,662	170,244
74	Number tons freight carried one mile North	246,796	174,357	125,756	337,727	71,087
75	Total number tons of freight carried one mile	595,283	433,048	355,547	515,389	241,331
76	Total tons paying weight carried one mile	636,436	477,663	400,959	558,923	272,585
77	Total tons paying and dead weight carried one mile	2,536,991	2,358,021	2,147,712	2,049,771	1,672,904
78	Dead weight of one train, exclusive of locomotive, tons	85.49	55.70	39.48	40.58	59.97
79	Percentage of paying to dead weight	33.49 per ct.	25.40 per ct.	22.95 per ct.	37.49 per ct.	19.46 per ct.
80	Cost per ton per mile of gross weight	1.20 cents.	1.37 cents.	2.09 cents.	1.14 cents.	1.36 cents.
81	Interest at 7 per cent. on cost of road per ton per mile	2.30 cents.	2.43 cents.	2.66 cents.	1.92 cents.	3.30 cents.
82	Cost per gross ton per mile, including interest	3.50 cents.	3.80 cents.	4.75 cents.	3.06 cents.	4.66 cents.
83	Cost per ton per mile net weight, passenger	34.72 cents.	35.13 cents.	46.54 cents.	36.44 cents.	46.41 cents.
84	Cost per ton per mile net weight, including interest	101.43 cents.	97.40 cents.	105.80 cents.	97.95 cents.	159.24 cents.
85	Number tons paying weight carried in one loaded freight car	6.68	6.05	5.29	9.26	5.63
86	Average number tons paying weight carried in freight-cars	4.54	3.52	3.09	6.36	3.46
87	Percentage of North to South tonnage	71.39 per ct.	67.39 per ct.	54.73 per ct.	190.09 per ct.	41.75 per ct.
88	Cost per ton of freight per mile	2.67 cents.	3.84 cents.	4.27 cents.	3.41 cents.	3.37 cents.
89	Interest at 7 per cent. on cost of road per ton per mile	5.01 cents.	6.71 cents.	5.44 cents.	5.76 cents.	8.19 cents.
90	Cost per ton of freight per mile, including interest	7.62 cents.	10.55 cents.	9.71 cents.	9.17 cents.	11.56 cents.

B*

* Loss.

V.—STATEMENT SHOWING COST OF RAILROAD TRANSPORTATION ON BARDSTOWN BRANCH, LOUISVILLE & NASHVILLE RAILROAD, DURING THE SEVEN YEARS FROM 1867 TO 1873.

No.	MIXED TRAIN.	1867.	1868.	1869.	1870.	1871.	1872.	1873.
1	Length of road in operation.	17.3 miles.	17.3 miles.	17.3 miles.	17.3 miles.	17.3 miles.	17.3 miles.	17.3 miles.
2	Cost of road and equipment.	$213,938 00	$214,137 00	$214,137 00	$218,422 00	$220,690 00	$221,923 00	$229,044 00
3	Cost of road per mile.	12,314 00	12,378 00	12,378 00	12,626 00	12,757 00	12,828 00	13,240 00
4	Interest on cost of road and equipment, at 7 per cent.	14,912 66	14,989 59	14,989 59	15,289 54	15,448 30	15,534 61	16,033 08
5	Operating expenses.	24,370 67	22,554 49	31,058 72	22,174 48	21,804 75	18,000 31	15,469 06
6	Operating expenses, including interest.	39,283 33	37,544 08	46,048 31	37,464 02	37,253 05	33,534 92	31,502 14
7	Percentage of interest (at 7 per cent.) on cost of road to operating expenses.	61.19 per ct.	66.40 per ct.	48.26 per ct.	68.95 per ct.	70.85 per ct.	86.30 per ct.	103.65 per ct.
10	Total number of daily trains over road, passenger and freight mixed.	1.79	1.94	1.96	1.85	1.89	1.82	1.97
11	Number of passenger-cars in each train.	2.85	2.53	2.08	2.00	2.18	1.95	2.00
12	Number of freight-cars in each train.	2.35	2.75	4.83	3.53	3.45	3.60	3.72
13	Total number of cars in each train.	5.20	5.28	6.91	5.53	5.63	5.55	5.72
15	Number of train miles, passenger and freight mixed.	11,276	12,264	12,402	11,668	11,916	11,484	12,456
16	Miles run by passenger-cars.	21,534	21,849	21,977	22,457	26,104	22,536	22,932
17	Miles run by baggage-cars.	10,603	9,190	1,019	391			1,944
18	Miles run by express-cars.			2,924	510			
19	Total mileage of passenger-cars.	32,137	31,039	25,920	23,358	26,104	22,536	24,876
21	Miles run by freight-cars, loaded.	18,987	23,164	46,125	29,338	29,223	28,331	33,716
22	Miles run by freight-cars, empty.	7,559	10,539	13,799	11,832	11,929	12,964	12,559
23	Total mileage of freight-cars.	26,546	33,703	59,924	41,170	41,152	41,295	46,275
24	Total number of miles run by passenger and freight-cars, mixed trains.	58,683	64,742	85,844	64,528	67,256	63,831	71,151
25	Cost per mile per car, passenger and freight, in mixed trains.	41.53 cents.	34.84 cents.	36.18 cents.	34.36 cents.	32.42 cents.	28.20 cents.	21.74 cents.
27	Cost per mile per car, pass. and fr't, mixed trains, incl'g interest.	66.94 cents.	57.99 cents.	53.64 cents.	58.05 cents.	55.39 cents.	52.54 cents.	44.27 cents.
29	Train earnings, from passengers.	$13,389 54	$13,019 56	$12,821 67	$13,444 18	$12,342 82	$11,134 56	$11,044 00
30	Train earnings, from freight.	7,572 13	9,981 02	12,704 60	12,914 80	11,631 02	9,621 72	11,881 67
31	Total train earnings.	20,961 67	23,001 48	25,526 27	26,358 98	23,973 84	20,756 28	22,925 67
32	Earnings from miscellaneous sources, passenger and freight.	50 04	50 04	151 04	35 00	35 00	2 00	2 00
35	Earnings per mile of road.	1,211 65	1,332 45	1,484 24	1,523 64	1,387 79	1,199 28	1,325 30
36	Net earnings, passenger.	1,204 21	1,742 31	*2,707 69	2,757 66	1,891 05	2,449 62	3,828 99
37	Net earnings, freight.	*4,613 21	*1,245 28	*2,673 72	1,426 84	313 04	308 00	3,629 62
38	Total net earnings.	*3,409 00	497 03	*5,381 41	4,184 50	2,204 09	2,757 62	7,458 61
39	Operating expenses and interest in excess of earnings, passenger.	6,251 99	5,752 55	10,202 15	4,610 69	5,514 02	5,045 48	4,925 51
40	Operating expenses and interest in excess of earnings, freight.	12,069 41	8,741 13	10,168 18	6,494 10	7,730 54	7,731 16	3,649 55
41	Total operating expenses and interest in excess of earnings.	18,321 40	14,493 68	20,370 33	11,104 79	13,244 56	12,776 64	8,575 06
42	Net earnings per mile of road.	*197 05	28 73	*311 07	241 88	127 40	159 40	431 13
43	Revenue from passengers per mile carried.	3.09 cents.	4.01 cents.	3.96 cents.	3.96 cents.	3.95 cents.	3.69 cents.	3.55 cents.
44	Revenue from freight per ton per mile.	8.83 cents.	5.10 cents.	5.59 cents.	6.57 cents.	5.40 cents.	6.00 cents.	4.77 cents.
47	Operating expenses per mile of road.	$1,408 70	$1,303 72	$1,795 30	$1,280 76	$1,260 39	$1,040 48	$894 16
48	Operating expenses per train mile.	2 16	1 84	2 50	1 90	1 83	1 57	1 24

TABLE V]   COST OF RAILROAD TRANSPORTATION.   11

No.		1	2	3	4	5	6	7
50	Number of passengers carried one mile	390,625	289,522	283,636	297,000	272,473	259,117	269,595
51	Number of passengers carried in one train	34.64	23.61	22.87	25.45	22.87	22.56	21.64
52	Number of passengers carried in one car	18.14	13.25	12.91	13.23	10.44	11.50	11.76
53	**Cost per passenger per mile, without baggage**	2.67 cents.	2.86 cents.	3.69 cents.	3.17 cents.	3.65 cents.	3.12 cents.	2.23 cents.
54	Dead weight carried in trains, passenger-cars, tons	344,544	349,584	373,609	404,226	469,872	411,282	424,242
55	Dead weight carried in trains, baggage-cars, tons	180,251	156,230	17,323	6,647			38,880
56	Dead weight carried in trains, express-cars, tons			35,088	6,120			
57	Dead weight carried in trains, freight-cars, tons	212,368	269,624	479,392	349,945	349,792	351,007	393,337
58	Total dead weight in trains, tons	737,163	775,438	905,412	766,938	819,664	762,289	856,459
59	Paying weight carried, at 150 lbs. per passenger, tons	29,297	21,714	21,273	22,275	20,435	19,434	20,220
60	Paying weight carried, at 80 lbs. baggage per passenger, tons	9,765	7,238	7,991	7,425	6,812	6,478	6,740
61	Paying weight, express, carried one mile, tons	10,542	10,542	10,542	10,542	10,542	10,542	10,542
62	Paying weight, mail, carried one mile, tons	142	142	142	243	243	243	243
63	Number of tons freight carried one mile South	38,938	48,850	51,552	59,490	58,933	60,901	66,155
74	Number of tons freight carried one mile North	46,811	146,698	175,608	136,851	156,507	99,314	184,757
75	Total number of tons freight carried one mile	85,749	195,548	227,160	196,341	215,440	160,215	248,912
76	Total tons paying weight carried one mile	135,495	235,184	266,208	236,826	253,472	196,912	286,657
77	Total tons paying and dead weight carried one mile	872,658	1,010,622	1,171,620	1,003,764	1,073,136	959,201	1,143,116
78	Gross weight of one train, exclusive of locomotive, tons	65.37	63.23	73.01	65.72	68.78	66.37	68.76
79	Percentage of paying to dead weight	18.38 per ct.	30.33 per ct.	29.40 per ct.	30.87 per ct.	30.92 per ct.	25.83 per ct.	33.47 per ct.
80	**Cost per ton per mile, gross weight**	2.79 cents.	2.23 cents.	2.65 cents.	2.21 cents.	2.03 cents.	1.88 cents.	1.35 cents.
81	Interest (at 7 per cent.) on cost of road per ton per mile	1.70 cents.	1.48 cents.	1.17 cents.	1.52 cents.	1.43 cents.	1.62 cents.	1.39 cents.
82	Cost per gross ton per mile, including interest	4.49 cents.	3.71 cents.	3.82 cents.	3.73 cents.	3.46 cents.	3.50 cents.	2.74 cents.
83	**Cost per ton per mile, net weight, passenger**	42.49 cents.	28.45 cents.	39.77 cents.	26.39 cents.	27.48 cents.	23.67 cents.	19.12 cents.
84	**Cost per ton per mile, net weight, including interest**	68.48 cents.	47.35 cents.	48.96 cents.	44.58 cents.	46.94 cents.	44.09 cents.	38.93 cents.
85	Number of tons paying weight carried in one loaded freight-car	4.52	8.44	4.92	6.69	7.37	5.66	7.38
86	Average number of tons paying weight carried in each freight-car	3.23	5.80	3.79	4.76	5.23	3.88	5.40
87	Percentage of North to South tonnage	120.22 per ct.	300.30 per ct.	340.64 per ct.	267.27 per ct.	267.27 per ct.	163.07 per ct.	276.25 per ct.
88	**Cost per ton of freight per mile**	14.21 cents.	5.77 cents.	6.84 cents.	5.85 cents.	5.27 cents.	5.81 cents.	3.31 cents.
89	Interest (at 7 per cent.) on cost of road per ton per mile	8.69 cents.	3.83 cents.	3.30 cents.	4.03 cents.	3.73 cents.	5.01 cents.	3.43 cents.
90	**Cost per ton of freight per mile, including interest**	22.90 cents.	9.60 cents.	10.14 cents.	9.88 cents.	9.00 cents.	10.82 cents.	6.74 cents.

* Loss.

VI.—STATEMENT SHOWING COST OF RAILROAD TRANSPORTATION

On Memphis Line and Nashville & Decatur Division of Louisville & Nashville Railroad during 1872 and 1873.

PASSENGER AND FREIGHT TRAINS.

No.		MEMPHIS LINE 1872.	MEMPHIS LINE 1873.	N. & D. DIV. 1873.
1	Length of road in operation	259.7 miles.	259.7 miles.	122.3 miles.
2	Cost of road and equipment	$6,192,333 00	$7,285,219 00	$4,000,000 00
3	Cost of road per mile	23,844 00	28,064 00	32,706 46
4	Interest on cost of road and equipment, at 7 per cent.	433,463 31	510,175 33	280,000 00
5	Operating expenses	1,333,724 96	1,298,362 60	585,887 72
6	Operating expenses, including interest	1,757,188 27	1,868,537 93	865,887 72
7	Percentage of interest (at 7 per cent.) on cost of road to operating expenses	32.74 per ct.	39.29 per ct.	47.79 per ct.
8	Average number of passenger-trains per day over road	4.17	4.29	4.30
9	Average number of freight-trains per day over road	5.85	5.37	4.40
10	Total number of trains over road daily	10.02	9.66	8.70
11	Number of passenger-cars in each train	4.34	4.19	3.51
12	Number of freight-cars in each train	14.36	13.26	14.51
13	Number of train miles, passenger	394,997	406,098	192,238
14	Number of train miles, freight	554,868	508,495	196,840
15	Total number of train miles	949,865	914,593	389,078
16	Miles run by passenger-cars	887,235	844,859	398,268
17	Miles run by sleeping-cars	418,158	420,723	81,164
18	Miles run by baggage-cars	395,759	403,554	195,299
19	Miles run by express-cars	13,834	33,080	
20	Total mileage of cars in passenger-trains	1,714,986	1,702,216	674,731
21	Miles run by cars in freight-trains, loaded	6,414,812	5,333,993	2,136,686
22	Miles run by cars in freight-trains, empty	1,556,422	1,407,743	729,129
23	Total mileage of cars in freight-trains	7,971,234	6,741,736	2,856,815
24	Cost per mile per car in passenger-trains	32.17 cents.	31.05 cents.	36.76 cents.
25	Cost per mile per car in passenger-trains, including interest	42.70 cents.	43.25 cents.	54.34 cents.
26	Cost per mile per car in freight-trains, loaded and empty	10.94 cents.	11.42 cents.	11.82 cents.
27	Cost per mile per car in freight-trains, including interest	14.52 cents.	15.90 cents.	17.46 cents.
28	Passenger-train earnings	$733,133 58	$705,892 70	$217,904 81
29	Freight-train earnings	1,011,726 25	971,861 92	474,427 85
30	Total train earnings	1,744,859 83	1,677,754 62	692,332 66
31	Earnings from miscellaneous sources, passenger	2,305 85	2,069 52	
32	Earnings from miscellaneous sources, freight	21 00	2,095 32	2,713 55
33	Total earnings from miscellaneous sources	2,326 85	4,164 84	2,713 55
34	Earnings per mile of road	6,718 75	6,514 90	5,683 12
35	Net earnings, passenger	183,644 06	179,398 03	*30,175 22
36	Net earnings, freight	139,817 66	204,158 83	139,333 71
37	Total net earnings	323,461 72	383,556 86	109,158 49
38	Operating expenses and interest in excess of earnings, passenger	†2,986 26	28,394 68	148,734 51
39	Operating expenses and interest in excess of earnings, freight	144,552 08	98,323 79	22,107 00
40	Total operating expenses and interest in excess of earnings	141,595 82	126,618 47	170,841 51

* Loss   † Gain

No.	Item			
42	Net earnings per mile of road	1,621 62	1,515 43	892 55
43	Revenue from passengers per mile carried	3.95 cents	3.77 cents	4.45 cents
44	Revenue from freight per ton per mile	2.27 cents	2.12 cents	2.68 cents
45	Dead weight of one passenger-train exclusive of locomotive, tons	93.32	92.05	72.15
46	Dead weight of one freight-train exclusive of locomotive, tons	122.11	112.69	123.36
47	Gross weight of one passenger-train exclusive of locomotive, tons	98.55	99.72	75.78
48	Gross weight of one freight-train exclusive of locomotive, tons	202.60	202.71	213.13
49	Operating expenses, passenger	551,795 37	528,564 19	248,080 03
50	Operating expenses, freight	871,929 59	769,798 41	337,807 69
51	Operating expenses per mile of road	5,097 13	4,999 47	4,790 57
52	Operating expenses per train mile, passenger	1 40	1 30	1 29
53	Operating expenses per train mile, freight	1 57	1 51	1 71
54	Number of passengers carried one mile	16,773,335	16,241,877	4,419,519
55	Number of passengers carried in one train	42.46	40.00	22.99
56	Number of passengers carried in one car	12.85	12.84	9.22
57	Cost per passenger per mile, without baggage	2.61 cents	2.42 cents	3.96 cents
58	Dead weight carried in passenger-trains, passenger-car, tons	16,192,039	15,451,892	7,367,958
59	Dead weight carried in passenger-trains, sleeping-car, tons	13,381,056	13,463,136	2,597,248
60	Dead weight carried in passenger-trains, baggage-car, tons	7,123,662	8,071,080	3,995,980
61	Dead weight carried in passenger-trains, express-car, tons	163,608	396,960	
62	Total dead weight in passenger-trains, tons	36,860,365	37,383,068	13,871,186
63	Paying weight carried at 150 lbs. per passenger, tons	1,258,001	1,218,141	331,464
64	Paying weight carried at 50 lbs. baggage per passenger, tons	419,333	406,047	110,488
65	Paying weight, express, carried one mile, tons	243,732	243,732	243,732
66	Paying weight, mail, carried one mile, tons	145,758	145,758	12,544
67	Total tons paying weight carried one mile	2,066,824	2,013,678	698,228
68	Total tons paying and dead weight carried one mile	38,927,189	39,396,746	14,569,414
69	Percentage of paying to dead weight	5.61 p. ct.	5.39 p. ct.	5.03 p. ct.
70	Cost per ton per mile of gross weight	1.42 cents	1.34 cents	1.70 cents
71	Interest at 7 per cent. on cost of road per ton per mile	0.46 cents	0.52 cents	0.81 cents
72	Cost per gross ton per mile, including interest	1.88 cents	1.86 cents	2.51 cents
73	Cost per ton per mile net weight	26.69 cents	26.25 cents	35.53 cents
74	Cost per ton per mile net weight, including interest	35.43 cents	36.56 cents	52.51 cents
75	Number of tons of freight carried one mile South	27,967,611	26,980,872	12,542,593
76	Number of tons of freight carried one mile North	16,695,625	18,793,887	5,128,884
77	Total number of tons freight carried one mile	44,663,236	45,774,759	17,671,477
78	Number of tons paying weight carried in one train	80.49	90.02	89.77
79	Number of tons paying weight carried in one loaded car	6.96	8.58	8.27
80	Average number of tons paying weight carried in each car	5.63	5.88	6.19
81	Percentage of North to South tonnage	50.70 p. ct.	69.66 p. ct.	40.90 p. ct.
82	Cost per ton of freight per mile	1.95 cents	1.68 cents	1.91 cents
83	Interest at 7 per cent. on cost of road per ton per mile	0.64 cents	0.67 cents	0.91 cents
84	Cost per ton of freight per mile, including interest	2.59 cents	2.35 cents	2.82 cents
85	Tons of dead weight carried one mile in freight-trains	67,755,489	57,304,756	24,282,928
86	Total tons of paying and dead weight carried one mile	112,418,725	103,079,515	41,954,405
87	Cost per ton per mile, gross weight	0.78 cents	0.74 cents	0.81 cents
88	Cost per ton per mile, gross weight, including interest	1.04 cents	1.03 cents	1.19 cents
89	Percentage of paying to dead weight	65.92 p. ct.	77.18 p. ct.	72.77 p. ct.

VII.—COST PER TRAIN MILE ON MAIN STEM, KNOXVILLE BRANCH, AND MEMPHIS LINE,

LOUISVILLE & NASHVILLE RAILROAD, DURING THE YEAR ENDING JUNE 30, 1873.

No.	HEADING OF ACCOUNTS	MAIN STEM				KNOXVILLE BRANCH				MEMPHIS LINE			
		OPERATING EXPENSES.	COST PER MILE. Pass'gr.	Freight.	Average	OPERATING EXPENSES.	COST PER MILE. Pass'gr.	Freight.	Average	OPERATING EXPENSES.	COST PER MILE. Pass'gr.	Freight.	Average
			CENTS.	CENTS.	CENTS.		CENTS.	CENTS.	CENTS.		CENTS.	CENTS.	CENTS.
	MAINTENANCE OF WAY AND BUILDINGS—												
	Road Repairs: Ballast	14,935 83	......	......	1.2146	8,020 52	......	......	4.1628	4,742 31	......	......	0.5185
1	Road tools	2,779 60	......	......	0.2406	1,058 50	......	......	0.5494	4,285 03	......	......	0.4685
2	Hand and dump-cars	3,097 43	......	......	0.2680	384 94	......	......	0.1998	2,977 71	......	......	0.3256
3	Extraordinary repairs	8,123 06	......	......	0.7029	267 71	......	......	0.1389	3,889 25	......	......	0.4452
4	Ditching, culvert masonry	14,504 63	......	......	1.2552	7,840 68	......	......	4.0694	24,146 02	......	......	2.6401
5	Cross-ties bought	32,658 79	......	......	2.8258	13,799 97	......	......	7.1624	27,217 17	......	......	2.9759
6	Labor replacing	14,650 17	......	......	1.2677	6,603 35	......	......	3.4272	11,045 13	......	......	1.2077
7	Train expenses hauling	3,947 66	......	......	0.3416	1,986 92	......	......	1.0312	1,466 66	......	......	0.1604
8	General expense	4,643 05	......	......	0.4018	1,907 19	......	......	0.9899	6,524 76	......	......	0.7134
10	Total	98,460 22	8.5202	8.5202	8.5202	41,869 78	21.7310	21.7310	21.7310	86,294 04	9.4353	9.4353	9.4353
11	Adjustment of track	60,472 32	5.2329	5.2329	5.2329	24,499 98	12.7158	12.7158	12.7158	87,366 08	9.5525	9.5525	9.5525
12	Rails, renewal	89,239 57	......	......	7.7223	20,100 24	......	......	10.4323	127,974 50	......	......	13.9925
13	Labor replacing rails	7,792 99	......	......	0.6743	2,954 41	......	......	1.5334	8,958 79	......	......	0.9795
14	Joint-fastenings	17,719 40	......	......	1.5333	6,931 02	......	......	3.5973	35,894 26	......	......	3.9246
15	Switches	13,362 06	......	......	1.1563	2,544 94	......	......	1.3209	12,024 85	......	......	1.3148
16	Train expenses hauling	2,007 84	......	......	0.1737	944 22	......	......	0.4900	2,205 43	......	......	0.2411
17	Total	130,121 86	11.2599	11.2599	11.2599	33,474 83	17.3739	17.3739	17.3739	187,057 83	20.4525	20.4525	20.4525
18	Total Road Repairs	289,054 40	25.0130	25.0130	25.0130	99,844 59	51.8207	51.8207	51.8207	360,717 95	39.4402	39.4402	39.4402
19	Bridge superstructure repairs	31,481 54	......	......	2.7242	5,636 86	......	......	2.9256	53,740 76	......	......	5.8759
20	Bridge masonry repairs	4,295 52	......	......	0.3717	196 15	......	......	0.1018	84 68	......	......	0.0092
21	Bridge watchmen	3,766 22	......	......	0.3259	326 62	......	......	0.1695	5,362 88	......	......	0.5863
22	Road watchmen	8,337 13	......	......	0.7214	696 60	......	......	0.3615	10,580 91	......	......	1.1568
23	Depot building repairs	11,687 85	......	......	1.0114	2,894 27	......	......	1.5021	6,517 13	......	......	0.7125
24	Shop building repairs	21,961 90	......	......	1.9004	369 11	......	......	0.1915	2,037 94	......	......	0.2228
25	Water-station repairs	10,919 47	......	......	0.9449	3,533 17	......	......	1.8337	4,727 24	......	......	0.5168
26	Section-house repairs	3,199 55	......	......	0.2768	481 01	......	......	0.2496	998 94	......	......	0.1092
27	Total	95,649 18	8.2767	8.2767	8.2767	14,133 79	7.3353	7.3353	7.3353	84,950 48	9.1895	9.1895	9.1895
28	Total Maintenance of Way and Bldgs, etc.	$384,703 58	33.2897	33.2897	33.2897	$113,978 38	59.1560	59.1560	59.1560	$444,768 43	48.6297	48.6297	48.6297

Table VII]   COST OF RAILROAD TRANSPORTATION.   15

No.	Item	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
29	General Office Expenses—Salary	19,531 29		1.6892			2,231 82				12,079 31			1.3207
30	Insurance	643 92		0.0557	0.0557		73 05			0.0382	398 50	0.0429		0.0436
31	General expense	30,917 84	1.9334	2.6754	2.6754		3,534 77	1.8346		1.8346	19,131 24	2.1927		2.0918
32	Total General Office Expenses	$51,083 05	4.4203	4.4203	4.4203		$5,840 22	3.3312	3.3312	3.3312	$31,609 05	3.4561	3.4561	3.4561
33	Machinery Dep't—Locomotive repairs	114,275 08	9.8886	9.8886	9.8886	9.8886	19,052 77	9.8886	9.8886	9.8886	87,463 69	9.5631	9.5631	9.5631
34	Passenger-car repairs	27,975 10	7.4591				4,882 45	7.1676			24,540 47	6.0429		
35	Sleeping-car repairs	7,251 09	1.9334	15.0590	15.0590						9,004 86	2.1927		
36	Freight-car repairs	138,797 72	17.7815				17,091 77	13.7223			68,397 33			
37	Engineers and firemen's wages	109,332 24	9.4609	9.4609	9.4609		18,228 68	9.4609	9.4609	9.4609	79,058 21	7.6600	7.6600	7.6600
38	Watching and cleaning engines	21,396 10	1.8437	1.8437	1.8437		3,552 30	1.8437	1.8437	1.8437	18,061 88	1.9748	1.9748	1.9748
39	Fuel used in engine-houses and shops	5,113 69	0.4425	0.4425	0.4425		852 59	0.4425	0.4425	0.4425	863 77	0.0944	0.0944	0.0944
40	Oiling and inspecting cars	8,242 50	0.7132	0.7132	0.7132		1,374 25	0.7132	0.7132	0.7132	5,457 91	0.5967	0.5967	0.5967
41	Supervision and general expense	10,928 94	0.8678	0.8678	0.8678		1,672 10	0.8678	0.8678	0.8678	8,293 11	0.9067	0.9067	0.9067
42	Wrecking account	7,456 04	0.3062	0.6454	0.6454		500 05	0.3244	0.3244	0.2595	5,635 85	0.1180	1.0141	0.6162
43	Fuel used by locomotives	169,749 46	14.6891	14.6891	14.6891		28,301 38	14.6891	14.6891	14.6891	119,185 81	13.0315	13.0315	13.0315
44	Oil and waste used by locomotives	11,974 84	1.0362	1.0362	1.0362		1,996 53	1.0362	1.0362	1.0362	8,720 08	0.9534	0.9534	0.0534
45	Oil and waste used by cars	11,113 06	0.6616	0.6616	0.6616		1,853 86	0.6616	0.6616	0.6616	2,703 47	0.2956	0.2956	0.2956
46	Water supply	15,548 10	1.3454	1.3454	1.3454		2,592 26	1.3454	1.3454	1.3454	14,413 35	1.5759	1.5759	1.5759
47	Mileage account, hire of cars and engines										23,927 35	2.2483	2.9099	2.6162
48	Total Machinery Department	$658,163 98	50,9520	59,8367	56,9534		$101,935 049	48,5590	55,2961	52,9134	$466,727 13	47,2540	54,0270	51,0306
	Conducting Transportation—													
49	Superintendence and general expense	35,071 32	2.8176	3.1392	3.0348		4,009 64	2.0077	2.1212	2.0811	28,439 50	2.9033	3.2742	3.1095
50	Agents and clerks	146,040 86	8.7101	14.5246	12.6374		16,451 74	6.2064	9.8114	8.5387	74,161 96	5.4712	10.2151	8.1087
51	Conductors and brakemen	129,556 86	8.6365	12.4481	11.2110		18,322 24	8.4395	10.0996	9.5095	75,917 64	7.0169	9.3260	8.3907
52	Station expenses	31,844 97	2.5575	2.8599	2.7556		3,640 73	1.8218	1.9271	1.8896	14,521 31	1.4724	1.6718	1.5877
53	Station labor, freight	84,439 57	10.8877	10.8877	7.3069		9,104 33	7.3095	7.3095	4.7253	38,085 94		7.4899	4.1642
54	Depot furniture	978 38	0.0786	0.0876	0.0646		111 97	0.0562	0.0591	0.0581	390 39	0.0398	0.0449	0.0427
55	Watchmen and switchmen	43,916 28	3.5882	3.9309	3.8002		5,020 84	2.5070	2.8167	2.6059	15,828 61	1.6159	1.8203	1.7306
56	Train expenses	48,656 80	7.4704	2.6441	4.2105		7,639 38	7.2922	2.1453	3.9649	17,889 03	2.0326	1.8989	1.9472
57	Telegraph expenses	22,694 05	1.8444	2.0211	1.0938		2,541 23	1.2724	1.3443	1.3189	14,446 10	1.4748	1.6633	1.5796
58	Telegraph repairs	20 60	0.0023	0.0015	0.0017						10	0.0012	0.0012	0.0012
59	Advertising and soliciting pass'gers and fr't	19,485 33	3.3350	0.7978	1.6861		1,233 28	0.8307	0.5358	0.6401	12,233 22	2.1565	0.6835	1.3376
60	Stationery and printing	38,324 24	3.0529	3.4349	3.3207		4,387 26	2.1968	2.3309	2.2770	5,890 21	0.6013	0.6781	0.6440
61	Damage to freight	16,831 94	2.1563	2.1563	1.4565		1,814 83	1.4570	1.4570	0.9419	15,999 13		3.1287	1.7395
62	Damage to persons	17,985 45	4.7534	0.0202	1.5564		8,310 45	6.4806	3.1279	4.3132	15,808 95	3.8596	0.0256	1.7285
63	Gratuity to employees	14,386 85	0.5794	1.5647	1.2449		1,598 68	0.4128	1.0578	0.8297	10,995 05	0.0604	2.1142	1.2021
64	Law expenses	7,937 69	0.6378	0.7105	0.6869		997 73	0.4544	0.4711	0.4711	2,737 19	0.2794	0.3151	0.2992
65	Damage to stock	15,025 78	2.9555	0.5949	1.3002		2,618 25	2.7625	0.5913	1.3389	11,393 93	2.1188	0.5486	1.2458
66	Lost baggage	9,045 83	2.4119		0.7827						678 07	0.1670		0.0741
67	Tax account	4,430 05	0.3345	0.3972	0.3833									
68	Total Conducting Transportation	$686,722 65	53,9560	62,0922	59,9442		$87,171 258	42,7320	47,2051	45,5239	$355,257 99	31,2711	44,8804	38,8429
69	Total Operating Ex. and Cost per Train Mile	$1,780,673 26	142,6180	159,5989	154,0876		$399,481 67	153,4782	164,6884	160,6245	$1,298,362 60	130,6109	150,9932	141,9593
70	*Train Mileage*		375,045	780,572	1,155,617			68,118	124,555	193,673		406,098	508,495	914,593

VIII.—STATEMENT SHOWING THE WEIGHT OF CARS AND LOCOMOTIVES, LOUISVILLE & NASHVILLE RAILROAD, JULY 1, 1873.

No. Cars	CLASS	Weight of Car — Per car, lbs.	Weight of Car — Total, lbs.	Seating Capacity	Length of Body (Feet)	Kind of Trucks	Where Built and When	Size of Mail-room	Size of Express-room
10	Passenger-cars	40,000	400,000	52	47 Feet	4 Wheel	Louisville & Nashville R. R. Shops, 1872–73		
10	"	40,400	404,000	52	47	4	" 1872–73		
9	"	30,000	270,000	40	45	4	" 1866–67		
9	"	32,000	288,000	38	42½	4	" 1866–67		
1	"	32,000	32,000	40	48	4	" 1866–67		
5	"	33,200	166,000	50	42	4	" 1866–67		
2	"	34,000	68,000	38	42½	4	" 1866–67		
1	"	50,000	50,000	40	48	6	" 1867		
3	"	44,650	133,950	54	50	4	" 1868–69		
1	"	45,500	45,500	48	48	4	" 1871–72		
1	"	40,100	40,100	48	48	4	" 1871–72		
6	"	39,500	237,000	48	47	6	" 1872–73		
4	"	40,500	162,000	50	46⅓	6	" 1868–69		
3	"	35,000	105,000	40	42	6	" 1867–69–70		
1	"	48,000	48,000	53	52	6	" 1872–73		
5	"	50,000	250,000	56	50	6	" 1869–70–72–73		
25	Sleepers, average weight	64,000		48	54 to 59 ft.	4	Ohio Falls Car Works		
8	Baggage-cars	33,100	264,800		42 Feet	6	Louisville & Nashville R. R. Shops, 1866–67	11–10 by 7–9	17–2 by 9–6
10	"	45,500	455,000		50	4	" 1871–72–73	14– 8 by 7–9	17–4 by 9–6
1	"	30,000	30,000			6	" 1866–67	11–10 by 7–9	17–4 by 9–6
1	"	30,000	30,000				" 1866–67	14– 8 by 7–9	17–4 by 9–6
	"	32,800	32,800				" 1866–67		
2	Express-cars	44,100	88,200		46¼	4	" 1866–67		
9	"	24,000	216,000		28	6	" 1868–69–70		
2	Postal-cars	45,500	91,000		50	4	" 1868–69	32– 7 by 9–7	17–3 by 9–7
1	"	47,600	47,600		50	6	" 1868–69	32– 7 by 9–7	17–3 by 9–7

FREIGHT CARS.

No. Cars	CLASS	Weight of Car — Per Car (lbs.)	Weight of Car — Total (tons)
1711	Box-cars	18,000	15,399.0
337	Rack-cars	18,000	3,033.0
434	Gondola-cars	15,500	3,751.0
534	Flat-cars	14,500	3,896.2

AVERAGE WEIGHT OF CARS.

CLASS	1867.	1868.	1869.	1870.	1871.	1872.	1873.
	tons.	tons.	tons.	tons.	tons.	tons.	tons.
Passenger-cars	16	16	17	18	18	18¼	18½
Sleeping-cars	25	25	27	29	32	32	32
Baggage-cars	17	17	17	17	17	18	20
Express-cars	10	10	12	12	12	12	12
Postal-cars			23	23	23	23	23
Freight-cars	8	8	8	8½	8½	8½	8½

AVERAGE WEIGHT OF LOCOMOTIVES.

	1867	1868	1869	1870	1871	1872	1873
	tons	tons	tons	tons	tons	tons	tons
Passenger, Main Stem	45	45	47½	50	50	52	53
Freight, Main Stem	50	50	50	52	54	55	55
Passenger, Knoxville Br'nch	37½	37½	37½	37½	37½	37½	41
Freight, Knoxville Branch	46½	47½	47½	46½	46½	46½	46½
Mixed, Bardstown Branch	47½	46½	46½	46½	47½	47½	47½
Mixed, Richmond Branch		47½	47½	47½	47½	47½	47½